BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 20 1937

MEDICINAL KAOLIN IN FOOD POISONING

A CRITICAL SURVEY

BY

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[WITH SPECIAL PLATE]

Kaolin is described in the *British Pharmacopoeia* as a native aluminium silicate, powdered and freed from gritty particles by elutriation. The stipulated tests are, however, insufficient to establish its identity, chemical purity, pharmacological activity, or freedom from insoluble gritty contaminants. It has acquired a wide popularity in recent years as a medicinal substance for internal use. Further pharmaceutical and pharmacological inquiry is desirable.

Kaolin is not a primary mineral, but always a secondary decomposition product from the weathering of granite and other rocks. The term is generic, covering many closely related substances of compositions varying with the geological circumstances. A number of hydrated silicates of aluminium which occur in nature cannot be classified as any form of kaolin at all. *X*-ray analysis and the application of optical and other physical tests show (Ross and Kerr, 1931) that there are at least three different groups of clay classified geologically as kaolin. These varieties are based on kaolinite, dickite, and nacrite respectively, each of which has the same chemical formula, $Al_2O_3.2SiO_2.2H_2O$. Kaolinite is the most common: nacrite is rare; dickite clays are found in Anglesea and worked commercially in Mexico.

Pharmaceutical Kaolins

The clays used therapeutically in this country have been derived chiefly from the fine china clays found in Cornwall and West Devon. These clays are of the kaolinite class. Other important deposits are worked in Czechoslovakia, Germany, France, U.S.A., and Japan.

China clays differ in general from ordinary rock clays in having a whiter colour, being less contaminated with extraneous minerals, and in possessing less plasticity. The lack of plasticity can be accounted for by the microcrystalline structure of many of their constituent particles, which contrasts with the amorphous nature of other clays. For this reason they are less likely to ball up and form concretions when taken internally. It is suggested that the term "medicinal kaolin" should be confined to purified china clays of the kaolinite type. Other types of china clay, or indeed of common clay, may eventually come to be accepted as medicinal substances, but present clinical experience is based on the use of kaolinite china clays, and future confusion might be avoided if, for pharmaceutical purposes, the term "kaolin" could be reserved for china clays of kaolinite foundation.

Ordinary china clay is obtained by elutriation of the crude mined material, whereby the bigger particles of quartz and mica and partially altered felspar are removed. Such commercial clays still contain much fine grit, impalpable to the fingers but readily detected as grittiness between the teeth. Under the microscope crystals of quartz, tourmaline felspar, and muscovite mica can be seen dispersed through the predominant kaolinite. Simple elutriation cannot achieve any greater purity than this.

To obtain the "colloidal" clays of commerce the kaolin particles are given an electrical charge by suspension in water and the addition of a suitable electrolyte. This process of peptization causes the kaolin to remain in suspension, but the heavier grits fall to the bottom. The true clay is then thrown out of suspension by flocculation with another electrolyte, or by the development of an electric field. When collected and dried it still contains some of the finest mica scales which have become entangled and failed to settle out, but it is no longer gritty to the teeth. It is suggested that medicinal kaolin for internal use should be defined as having been freed from grit not merely by elutriation but also by peptization and flocculation or by some equivalent process yielding a high-grade "colloidal clay."

Examination of proprietary medicinal brands indicates that in certain cases the colloidal clays of commerce have been refined still further. Even these are not entirely amorphous, but contain microcrystalline elements of kaolinite mixed with the true argile colloidale. The particles of the latter are invisible under a 1/12 in. objective. All kaolins purified by wet processes are contaminated by adsorbed electrolytes, which affect their physical properties. If suitable additional electrolytes are used to counteract the flocculating effect of those already present the strictly colloidal element will remain suspended in water indefinitely. The rest will slowly settle out.

Representative pharmaceutical kaolins were examined to determine (1) how closely they approached in composition to the idealized substance $Al_2Si_2O_7.2H_2O$; (2) to what extent they were contaminated by grit; (3) whether they became agglutinated into a sticky clay on the addition of water.

Composition of Kaolin

Estimations were made of aluminium, silica, magnesium, calcium, lead, arsenic, soluble chloride, soluble organic matter, and moisture. The results are given in Table I.

TABLE I.—*Quantitative Analysis (Per Cent.)*

Clay	Al_2O_3	SiO_2	Fe_2O_3	CaO	MgO	Loss on Ignition	Ratio Si : Al (Theoretical 1.04)
1. Kaolin *B.P.* ...	36.16	46.92	0.28	1.49	0.89	12.81	1.14
2. Kaolin *B.P.* ...	38.15	44.67	0.27	1.01	0.25	13.17	1.03
3. Collosol kaolin...	36.84	48.13	0.23	0.68	0.05	13.60	1.16
4. Kaolin (Kaylene)	35.63	46.18	0.47	0.84	0.50	14.00	1.14
5. Osmo kaolin ...	38.46	46.47	0.12	0.51	1.20	13.22	1.06

The percentages do not furnish any direct clue to contamination by silica and mica, the constituent elements of which would merely contribute to the figures in the first two columns. The calcium and magnesium, however, do indicate extraneous mineral matter; the former reaches a significant figure in No. 1 and the latter in No. 5.

All the specimens conformed to *B.P.* standards for free unadsorbed lead, arsenic, chlorides, and organic contaminants. The ratio of Si:Al::1:1.04 in the idealized formula is realized fairly adequately in every case, the closest approximation being achieved by No. 2. It is suggested that neither CaO nor MgO should be present in amounts of 1 per cent. or more, and that the ratio Si : Al should not depart from the idealized figure for kaolinite by more than 10 per cent.

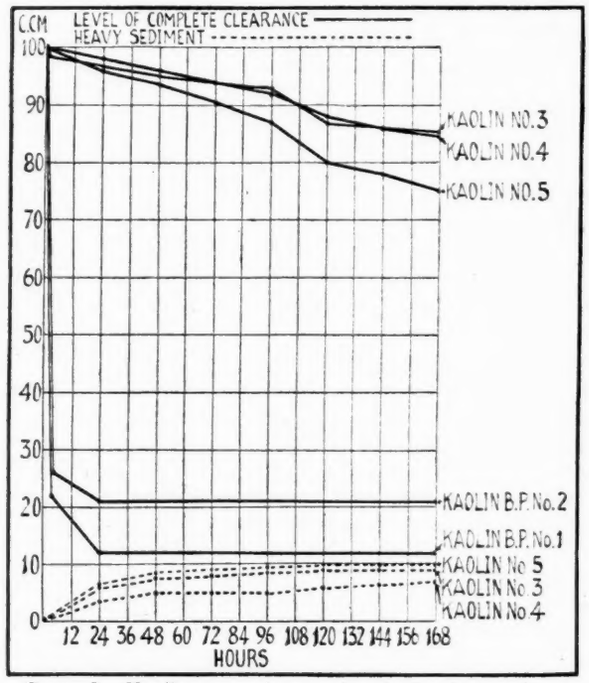
Grit

Twelve samples of *B.P.* kaolin were purchased from various retail and wholesale houses. With one solitary exception their grit content was so high as to be detectable by grinding the clay between the teeth. Three medicinal kaolins sold under registered names were free from any comparable amounts. All the *B.P.* clays were of the flocculated variety contaminated by uncompensated electrolytes so that when suspended in water they settled out rapidly into a sticky coagulum conducive to the formation of intestinal concretions. The three special clays, however, became peptized when water was added, and therefore remained in suspension with relatively little tendency to throw down any plastic deposit. These three kaolins were selected for further survey, also two samples of *B.P.* kaolin bought from important wholesale houses and therefore representative of the kaolin furnished for dispensing purposes to a large section of medical practitioners and retail chemists.

A certain amount of gritty matter could be obtained from every sample of kaolin by the following method. The clay was mixed with water and peptized completely by the addition of sodium pyrophosphate. The full physical dispersion of the kaolin secured by this means liberated small grits which had been entangled by the clay; these quickly separated out as a sandy deposit. This granular debris contained much amorphous matter, made up of conglomerations of kaolinite encapsulated in humus derived from the water used in the preliminary elutriation processes carried out at the mines. These were resolved by destroying the humus with nitric acid. The kaolin and grit were then separated by repeptization with pyrophosphate, and the finally deposited grits were examined under the microscope.

The *B.P.* kaolin yielded a relatively high proportion of grit and the other kaolins comparatively little. The photomicrographs (Plate, Figs. 1 and 2) show deposits obtained from *B.P.* kaolin and from one of the registered kaolins respectively. A striking qualitative difference between these two deposits is apparent, as well as a quantitative one. The material from the registered clay consists almost entirely of very thin flat scales of mica with a hexagonal tendency. Similar scales are to be seen in the *B.P.* kaolin deposit also, but in this case they are covered over densely by small thick angular fragments of quartz and similar abrasive substances. Among them are interspersed numerous irregular large black masses of cruder contaminants.

The sedimentation rates of the various clays were measured by filling a 100 c.cm. cylinder with a 5 per cent. suspension in distilled water, and measuring the steady rise in the heavy deposit at the bottom and the rate of formation of the absolutely clear zone at the top of the cylinder. The results are incorporated in Graphs I, II, and III,



GRAPH I.—Kaolin suspensions, and rate of sedimentation.

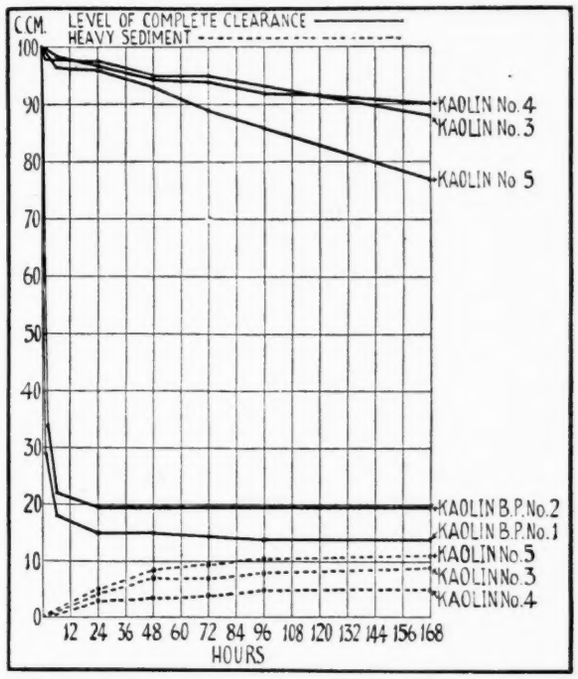
representing three sets of observations on each of the five selected kaolins. The *B.P.* kaolin settled out almost completely in an hour, but a great part of each registered kaolin remained in suspension for a week. The dotted curves measure the heavy deposit of grit plus the flocculated sticky fraction of the clay. The non-dotted curves measure the extent to which subcolloidal dispersion occurred. The radical physical difference between the two types of clay is apparent at a glance, the best figures being given by No. 4.

Adsorption

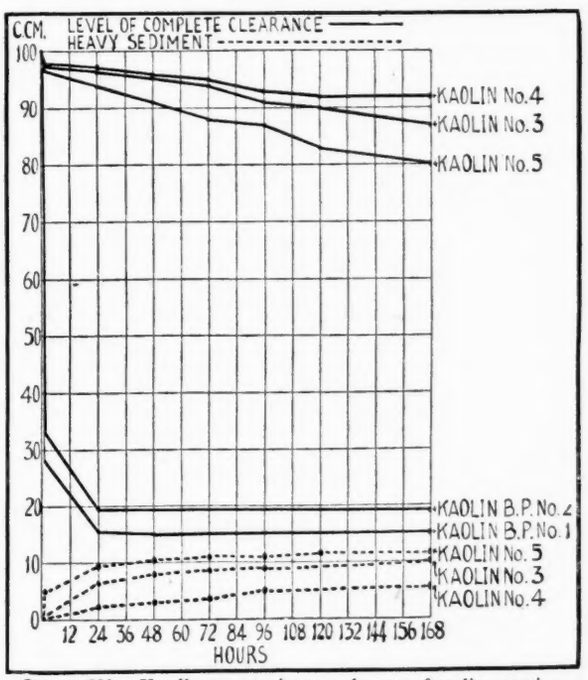
Commercial kaolins vary widely in their properties. Even when the clays selected come from a single county —for example, Cornwall, where all have a similar origin from the felspars of the granite of the district—several different types can be found. Some have physical properties which render them particularly suitable for certain purposes, whilst others, poorly adapted for those objects, are specially desirable in other directions (Coon and Lewis, 1926). It is generally agreed that the therapeutic utility of kaolin taken internally is dependent on its adsorptive affinities. By virtue of these it removes toxic substances from solution, modifies saprophytico-chemical processes

by adsorbing intermediate products, and is available as a surface catalyst.

Great differences have been found by Rae (1928) between the adsorptive capabilities of various kaolins. Hellmut Müller (1935), working in California with concentrates of mussel poison, found that German kaolin (Merck) would not remove more than 50 per cent. of the toxic substance from an aqueous solution, and that activated charcoal would not remove any at all. The variety of English kaolin employed in the present experiments removed the toxic substances completely. In recording experiments of this kind it is therefore important to define as precisely as possible the nature of the material to which the term "kaolin" has been applied. The common omission of authors to do so in the past has made it difficult for later workers to correlate their findings.



GRAPH II.—Kaolin suspensions and rate of sedimentation.



GRAPH III.—Kaolin suspensions and rate of sedimentation.

For the purpose of the present investigation kaolin No. 4 was selected as based on kaolinite, and as being uncontaminated by any excess of extraneous mineral matter (CaO and MgO content each below 1 per cent., and the ratio Si : Al within 10 per cent. of the ideal). It had obviously been purified, not merely by elutriation, but also by a method involving peptization or some kindred process, and appeared to have undergone further pharmaceutical refinement. Its sedimentation rate and optical appearances showed it to be exceptionally free from particles of microscopical grit. It would seem, therefore, to approximate to the idealized mineral more closely than the other specimens examined.

The range of action of a therapeutic adsorbent is quite as important as its potency. Kaolin No. 4 was therefore tested with a series of dyes representing several chemical groups, both crystalloids and colloids, and including both acidic and basic dyes. When a solution of dye is added to a suspension of kaolin it is decolorized. If a standard solution of dye is added drop by drop until a faint perceptible coloration remains in the supernatant fluid the total weight of dye adsorbed at this clearance point is easily calculated. The addition of further dye increases the depth of colour of the suspending fluid but does not lead to any appreciable increase in the amount adsorbed.

In other words, the clearance and saturation adsorptive potencies for kaolin are almost identical. This contrasts strongly with magnesium trisilicate and charcoal, each of which gives saturation figures considerably in excess of the clearance values (Mutch, 1936). Estimations at the clearance point are the more convenient for kaolin, but for adsorbents of the magnesium silicate and charcoal types saturation figures are the only dependable ones.

Table II shows the amount of each dye removed by

TABLE II.—*Dyes*

Dye	Chemical Group	General Group: Basic	General Group: Acidic	General Group: Residual Preponderance of Sodium Salt*	Physical State: Crystalloid	Physical State: Colloid	Physical State: Semicolloid*	Weight Removed by 1 gramme of Kaolin No. 4
								mg.
Methylene-blue	Thiazine	B			+			14
Safranine	Azine	B			+			15
Brilliant green ...	Triphenyl-methane	B			+			15
Malachite green ...		B			+			5
Victoria blue ...		B				+		25
Methyl-violet ...		B			+			5
Basic fuchsine ...		B			+			10
Acid fuchsine (magenta)			A	B			+	2
Acid green G ...			A	B			+	5
Disulphine blue ...			A	A	+			5
Fast acid violet 10B			A	B	+			15
Chrysoidin	Azo	B			+			2
Carmioisin W.S.... ...	Monazo		A	A	+			2
Coomassie navy blue 2 R.N.	Secondary diazo		A	A		+		10
Congo red	Tetrazo		A	B		+		10
Eosine	Phthalein		A		+			2
Mercurochrome ...		B			+			2
Indigo-carmine	Indigotin		A	A	+			0

* Mutch, N. (1936)

1 gramme of the selected kaolin. Adsorption proved to be selective, and preference was shown for basic dyes. Nevertheless certain acidic dyes also were taken up substantially. Examples are to be seen both of the active removal of crystalloids and of colloids. In the case of colloidal dyes no attempt was made to differentiate between true adsorption and mutual flocculation.

Adsorption of Alkaloids

The adsorptive activity for alkaloids was measured by observing the smallest weight of kaolin needed to clear 10 c.cm. of a 0.1 per cent. solution of each alkaloidal salt in one hour. The results are given in Table III, in

TABLE III.—*Alkaloids*

Alkaloid	Weight of Alkaloidal Salt Removed by 1 gramme of Kaolin No. 4	Alkaloid	Weight of Alkaloidal Salt Removed by 1 gramme of Kaolin No. 4
	mg.		mg.
Apomorphine hydrochloride	5	Brucine hydrochloride	4
Atropine sulphate	5	Dionine hydrochloride	3
Cocaine hydrochloride ...	5	Colchicine salicylate ...	2
Muscarine	4	Pilocarpine nitrate ...	1.5
Solanine	4	Emetine hydrochloride	1.5
Strychnine hydrochloride	4	Morphine hydrochloride	1.5
Papaverine hydrochloride	4	Veratrine	1
Codeine phosphate ...	4	Nicotine	1

which wide variations in the relative amounts of alkaloid adsorbed are to be noted. Comparison of Tables II and III with the results given in an earlier paper (Mutch, 1936), in which magnesium trisilicate was used as the adsorbent instead of kaolin, reveals not only quantitative differences between the adsorptive potencies of these two substances, but also great qualitative divergencies in their respective ranges of selection. The order of selectivity of the two silicates is radically different both in respect of dyes and of alkaloids.

It is thus clearly impossible to foretell from dye experiments alone with what vigour an adsorbent will remove any specific toxin from solution. Assessment of clinical utility by reference to the adsorption of one dye or another is unwarranted unless supported by direct observations on the adsorption of the actual toxic bodies concerned. Kaolin has obtained wide popularity in the treatment of food poisoning. Definite food poisons were therefore taken as the basis for further observations.

Mussel Poison

Many molluscs contain a little toxic matter, which varies in amount with the season and from year to year. Hermann Sommer and Karl F. Meyer (1935) explain the sporadic outbursts of shellfish poisoning as occurring at times when the poison content has become unusually high. H. Müller (1935) recently extracted the poison, and secured a concentrate of intense toxicity. He found it one hundred times as potent as potassium cyanide, and twice as deadly as strophanthin. A standard solution of this substance, for which I am indebted to Dr. Hermann Sommer of California University, was injected intraperitoneally into twenty-five mice (20 grammes) in amounts from 0.01 c.cm. to 1 c.cm. The minimum lethal dose (M.L.D.) was found to be 0.05 c.cm. To a series of flasks each containing 10 c.cm. of this solution were added various amounts of kaolin No. 4. After shaking and allowing to stand for an hour the contents were filtered, and intraperitoneal test injections were made in mice, with the results set out in Table IV. From the figures

TABLE IV.—*Mussel Poison*

Weight of Kaolin No. 4 Added to 10 c.cm. of Mussel Poison Solution (M.L.D. = 0.05 c.cm.)	Mouse	Volume Injected Intraperitoneally	Original Toxic Content of Fluid Injected	Result
grammes		c.cm.	M.L.D.	
8	1	0.5	10	No effect
5	2	0.5	10	,,
4	3	0.1	2	,,
	4	0.2	4	,,
	5	0.5	10	,,
2.5	6	0.1	2	,,
	7	0.2	4	,,
	8	0.5	10	,,
2	9	1.0	20	Dead in twenty minutes
	10	0.2	4	No effect
1	11	0.2	4	Dead in 10 minutes

Controls

Mouse	Volume of Mussel Poison Solution (Untreated) Injected	Result
	c.cm.	
12	0.01	Slight malaise for ½ hour
13	0.02	,, ,,
14	0.03	Slight malaise for ¾ hour
15	0.04	Very ill in 5 minutes; recovered in 1 hour
16	0.05	Dead (5 minutes)
17	0.05	Dead (20 minutes)
18	0.06	Dead (less than 5 minutes)
19	0.10	,, ,,
20	0.15	,, ,,
21	0.20	,, ,,
22	0.20	,, ,,
23	0.20	,, ,,
24	0.40	,, ,,
25	0.40	,, ,,
26	0.40	,, ,,
27	0.40	,, ,,
28	1.00	,, ,,

given it is easy to calculate that 1 gramme of the adsorbent removed more than seventy-two minimum lethal doses (mouse 8) and rather less than 95 M.L.D. (mouse 9). The mean of 94 M.L.D. per gramme may be taken as the adsorption potency in respect of mussel poison.

Mushroom Poisoning

Many varieties of poisonous fungi of the mushroom type are known. In certain of them the toxic element is the alkaloid muscarine, a substance which is readily adsorbed by the kaolin used in these experiments. Various strengths of muscarine in water were treated with this adsorbent and filtered after standing for an hour. The filtrate was tested for toxicity to the frog by injection into

the dorsal lymph sac. The results are given in Table V. From the data relating to frogs 6, 7, and 11 it can be calculated that 12 grammes of the clay removed more

TABLE V.—*Mushroom Poison (Muscarine)*

Strength of Muscarine Solution	Weight of Kaolin No. 4 used to Treat 10 c.cm. of Muscarine Solution	Frog	Volume Injected into Dorsal Lymph Sac	Original Muscarine Content of Fluid Injected	Result
per cent.	grammes		c.cm.	mg.	
0.2	5	1	0.1	0.2	No effect
		2	0.5	1.0	,,
		3	1.0	2.0	,,
0.6	12	4	0.5	3.0	,,
		5	0.5	3.0	,,
		6	1.0	6.0	,,
		7	1.0	6.0	,,

Controls

Frog	Weight of Muscarine Injected into Dorsal Lymph Sac	Result
	mg.	
8	0.2	No effect
9	1.0	,,
10	1.0	,,
11	1.5	Prostrate in 20 minutes (recovered in 24 hours)
12	2.0	Prostrate in 15 minutes (recovered in 24 hours)
13	2.0	Dead in 30 minutes
14	2.5	,, ,,
15	3.0	,, ,,
16	3.0	,, ,,
17	4.0	,, ,,
18	6.0	,, ,,
19	6.0	,, ,,

than 45 mg. of muscarine from solution. The adsorption potency is therefore at least 3.8 mg. of muscarine per gramme.

Potato Poisoning

The alkaloid solanine occurs in the potato. At times its concentration in the green shoots reaches a harmful level and outbreaks of poisoning occur. Recently sixty cases and one death were reported from Cyprus (Willimott, 1933). The solanine content of the suspected potatoes amounted in certain cases to 9 mg. per 100 grammes of tuber, and almost to 50 mg. per 100 grammes of shoot. A solution of solanine acetate was therefore prepared containing 0.1 per cent. of the alkaloidal base; 10 c.cm. were treated with 2 grammes of the kaolin and filtered an hour later. The supernatant fluid was heated on a water-bath with half its volume of concentrated hydrochloric acid, and tested with Mayer's solution with almost negative results. A control carried through with the original solanine solution gave a strongly positive reaction. The adsorption potency of kaolin No. 4 for solanine is therefore a little less than 5 mg. of alkaloid per gramme of kaolin.

Putrefactive Amines

Various pharmacologically active substances are evolved during the decomposition of proteins by intestinal bacteria. Histamine was selected as an example of such a substance because of its wide interest to the pathologist and its therapeutic applications; 0.1 per cent. aqueous solutions of the phosphate were treated and filtered. The filtrate and recovered kaolin resuspended in distilled water were tested for histamine by the diazo reaction. The recovered kaolin gave universally strongly positive reactions, but the filtrate gave negative reactions whenever 2 grammes or more of the adsorbent had been used to treat 10 c.cm. of the histamine solution. At the clearance point 1 gramme of kaolin No. 4 adsorbed 5 mg. of histamine phosphate.

Bacterial Toxins

An aqueous solution of dried tetanus toxin was prepared; 20 c.cm. were shaken with 1 gramme of the kaolin and filtered (filtrate A). Another volume was incubated at 37° C. with 1 gramme of the kaolin and then filtered (filtrate B). These filtrates, the original toxin solution, and a portion of the original solution which had been incubated for an hour at 37° C. were injected subcutaneously into mice in varying amounts. The site chosen was the left thigh. The results given in Table VI show conclusively that solutions of tetanus toxin are detoxicated by kaolin No. 4.

TABLE VI.—*Tetanus Toxin*

Mouse	Inoculum	Dose (per 20 grammes)	Result: Day 1	2	3	4	5	6	7
		c.cm.							
1	Toxin solution	0.06	Nil	Spasm	Spasm	Dead			
2	Toxin solution	0.12	Nil	Spasm	Dead				
3	Toxin solution	0.18	Slight spasm	Dead					
4	Incubated toxin solution	0.06	Nil	Spasm	Spasm	Spasm	Spasm	Dead	
5	Incubated toxin solution	0.12	Slight spasm	Spasm	Spasm	Spasm	Dead		
6	Incubated toxin solution	0.18	Spasm	Spasm	Spasm	Dead			
7	Toxin solution treated with kaolin No. 4 (filtrate A)	0.06	Nil	.....	.....	.....	.....	.....	→ Nil
8	Toxin solution treated with kaolin No. 4 (filtrate A)	0.12	Nil	.....	.....	.....	.....	.....	→ Nil
9	Toxin solution treated with kaolin No. 4 (filtrate A)	0.18	Nil	.....	.....	.....	.....	.....	→ Nil
10	Toxin solution incubated with kaolin No. 4 (filtrate B)	0.06	Nil	.....	.....	.....	.....	.....	→ Nil
11	Toxin solution incubated with kaolin No. 4 (filtrate B)	0.12	Nil	.....	.....	.....	.....	.....	→ Nil
12	Toxin solution incubated with kaolin No. 4 (filtrate B)	0.18	Nil	.....	.....	.....	.....	.....	→ Nil

Emulsions Containing Kaolin and Liquid Paraffin

It has become a common practice to counteract the constipating action of kaolin by administering it in an emulsion of liquid paraffin. It has been assumed that the adsorptive action of the kaolin is unimpaired provided that the kaolin is dispersed in the watery phase of the emulsion and not in the oil itself. The following experiments were devised to test the validity of this assumption.

Emulsions were prepared as follows: A, 50 c.cm. liquid paraffin with 50 c.cm. water (total 100 c.cm.); and B, 50 c.cm. liquid paraffin, 11 grammes kaolin No. 4, and 44.4 c.cm. water (total 100 c.cm.). To 50 c.cm. of each was added 10 c.cm. of a 3 per cent. solution of Müller's mussel poison concentrate (M.L.D. mouse = 0.025 c.cm.). After shaking and stirring, the emulsions were resolved as far as possible by warming at 37° C., and were filtered through a double filter paper previously well moistened with water. The toxicity of the filtrates

was tested by intraperitoneal injection into mice. The results are given in Table VII.

TABLE VII.—*Mussel Poisoning (Detoxication by Emulsions)*

Mouse	Inoculum	Volume Injected	Original Toxic Content of Fluid Injected	Result
		c.cm.	M.L.D.	
1	Toxin solution after treatment with an emulsion containing kaolin No. 4 and liqu d paraffin	0.2	2.5	No effect
2		0.5	6	,,
3		1.0	12.5	,,
4	Toxin solution after treatment with a simple paraffin emulsion	0.2	2.5	Dead (less than 5 minutes)
5		0.5	6	,, ,,
6		1.0	12.5	,, ,,

It is clear that a simple emulsion of liquid paraffin has no significant detoxicating action on solutions of mussel poison, but that similar emulsions containing kaolin No. 4 in the watery phase detoxicate such solutions effectively. From the data given it can be calculated that 400 M.L.D. were used and more than 368 M.L.D. were removed by the 5.5 grammes of the adsorbent in the 50 c.cm. of emulsions employed.

The adsorption potency of the kaolin in this oil and watery medium is therefore greater than 67 M.L.D. of mussel poison per gramme, which compares very favourably with the potency of the same variety of kaolin in a simple suspension of water as given earlier in the paper. By repeating this experiment with stronger solutions of toxin a higher figure still could doubtless be obtained.

Mushroom poison (muscarine) was used in a second test; 20 c.cm. of 0.2 per cent. muscarine were added to 70 c.cm. of each of the two emulsions already employed. These were incubated at 37° C. to break up the emulsion, and were filtered through wet filter paper. The filtrate was evaporated at room temperature in a desiccator, and the residue was taken up in a small measured amount of distilled water—concentration factor 15. A control solution of 0.2 per cent. muscarine was diluted with a volume of water equivalent to that in the emulsion; it was then incubated, filtered, evaporated, and redissolved in an exactly equivalent volume of water. The three final solutions were then injected into the dorsal lymph sacs of a series of frogs, with the results given in Table VIII.

TABLE VIII.—*Mushroom Poisoning (Muscarine) (Detoxication by Emulsions)*

Frog	Inoculum	Volume Injected	Original Toxic Content of Fluid Injected	Result
		c.cm.	mg.	
1	After treatment with an emulsion containing kaolin No. 4 and liquid paraffin	0.5	6	No effect
2		0.8	10	,,
3	After treatment with simple emulsion of liquid paraffin	0.5	5.5	Prostate in 15 mins. Dead in less than 2 hours
4		0.8	9	,, ,,
5		1.2	13	,, ,,
6	Control solution	0.25	3	,, ,,
7		0.25	3	,, ,,
8		0.40	5	,, ,,
9		0.40	5	,, ,,

It is evident that a simple emulsion of liquid paraffin has no detoxicating effect on solutions of muscarine, but that paraffin emulsions containing kaolin No. 4 in the watery phase detoxicate such solutions vigorously.

A final observation was made with histamine; 5 c.cm. of 0.05 per cent. histamine phosphate in aqueous solution was added to 10 c.cm. of each of the two test emulsions. The emulsion was shaken and mixed, and then broken up by centrifuging; the recovered watery element was tested for histamine by the diazo reaction against controls of the original solution proportionately diluted. There was no sensible reduction in the intensity of the reaction in the fluid recovered from the simple paraffin emulsion, but the reaction was completely negative in that recovered from the kaolin paraffin emulsion. This putrefactive amine was clearly not removed by the paraffin, but was completely taken out of the solution by the paraffin emulsion containing kaolin No. 4.

Summary

1. A basis has been suggested for the more precise definition of medicinal kaolin.

2. It has been shown that, although the usual material sold as kaolin *B.P.* conforms to official standards, it is still grossly contaminated with sharp grits undesirable in a medicine designed for internal use.

3. Attention has been drawn to the sticky flocculated condition assumed by many kaolins when suspended in water.

4. Many of the failures of indiscriminate kaolin therapy can be explained as due to the use of unsuitable preparations—namely: (*a*) those containing abrasive gritty contaminants; and (*b*) those which tend to coalesce into sticky masses because they contain uncompensated electrolytes.

5. The range of the adsorptive affinities of kaolin for dyes and alkaloids has been investigated quantitatively.

6. The impossibility of deducing the therapeutic potency of an adsorbent from an estimation of its ability to adsorb some arbitrarily chosen dye has been demonstrated. The importance of measuring its power of adsorbing specific toxic materials of clinical significance has been stressed.

7. Kaolin is used extensively in the treatment of food poisoning. The adsorption of a series of known food poisons has therefore been investigated.

8. It is recommended that the therapeutic efficiency of kaolins and allied substances shall not be assayed in terms of methylene-blue, Congo red, or any other dye, but in terms of some definite food poison or decomposition product.

9. Quantitative data have been given concerning the adsorptive potency of kaolin in the presence of liquid paraffin.

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A. M. Meerloo (*Nederl. Tijdschr. Geneesk.*, February 13, 1937, p. 668) records three illustrative cases of chronic intoxication by hypnotics such as luminal and veronal and the toxic psychosis which may ensue. Special emphasis is laid on barbitone toxicomania and the danger of the sudden development of intolerance in cases of prolonged ingestion of the barbitones. Treatment consists in washing out the stomach, injection of coramine and strychnine, venesection, and lumbar or cisternal puncture. Somatic treatment must always be followed by psychotherapy.

INFECTIOUS MONONUCLEOSIS (GLANDULAR FEVER) AND MONOCYTIC LEUKAEMIA

BY

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[WITH SPECIAL PLATE]

It has been recognized for some years that the differential diagnosis between infectious mononucleosis and lymphatic leukaemia may be difficult (Sprunt and Evans, 1920; Downey and McKinlay, 1923; Baldridge, Rohner, and Hansmann, 1926). The possibility of confusion with monocytic leukaemia has received less attention, probably because of the relative rarity of this type of leukaemia. The comparison is instructive from two points of view: (1) the differential diagnosis is important since the patient always recovers from infectious mononucleosis, whereas monocytic leukaemia is equally fatal; (2) it assists in deciding the nature of the mononuclear cells in infectious mononucleosis.

The distinction of a separate type of monocytic leukaemia is now agreed upon by most authorities. Several cases have been recorded in America (Dameshek, 1930; Doan and Wiseman; Forkner; and Levine, 1934), but in this country reliable reports have been rare (Gittins and Hawksley, 1933; Orr, 1933; and Whitby and Christie, 1935); it is therefore proposed to describe a case of monocytic leukaemia recently under observation and to contrast its clinical and haematological features with those of two notably dissimilar cases of infectious mononucleosis.

Case I.—Acute Monocytic Leukaemia

A housewife aged 53 was admitted to the Manchester Royal Infirmary on April 14, 1936. Four months previously she had noticed that she was short of breath on exertion and felt unduly tired. These symptoms had become worse, and it had been noticed that she was losing weight and becoming paler; the dyspnoea was sometimes accompanied by a feeling of constriction round the chest. There was no pain of any sort, but discomfort after food, which had been present for many years, was worse. Her appetite was poor, and she complained of an unpleasant taste in her mouth. The bowels were constipated, but micturition was normal. The menopause had taken place five years before. No haemorrhages had occurred, and no swellings had been noticed. There was nothing of importance in the previous medical and family histories.

Clinical Examination.—The patient was seen to be very pale and thin. The tongue was furred and dry and the teeth were carious. There was marked halitosis, but no ulceration of the gums, tonsils, or the mucous membranes of the mouth and throat; they were merely congested. The temperature was 101° F. and the pulse regular, its rate being 112. The spleen was not palpable and the liver not enlarged. Some signs of consolidation were present at the bases of both lungs. The heart and central nervous system presented no unexpected signs. The urine contained a trace of albumin. The blood count showed: red cells, 1,090,000 per c.mm.; haemoglobin, 30 per cent.; colour index, 1.36; white cells, 14,000 per c.mm.; polymorphonuclears, 0.25 per cent.; lymphocytes, 2.75 per cent.; monocytes, 49.75 per cent.; eosinophils and basophils absent; immature monocytes and monoblasts, 47.25 per cent.; and nucleated red cells, 1 per 400 white blood cells.

The monocytes (Figs. 1, 2, and 3 on Special Plate) were: (1) typical cells with convoluted nuclei and grey-blue cytoplasm containing a few azurophil granules, and (2) cells with very lobulated nuclei often of bizarre shapes; these cells superficially looked like polymorphonuclears, but their cytoplasm was typically grey-blue with only a few azurophil granules, and most of them were oxidase-negative. About 50 per cent. of the monocytes were of this latter type, which have been described and named "blood histiocytes" by Levine (1934). The monoblasts were large and resembled myeloblasts, but there was usually more cytoplasm. There were many forms transitional between the typical blasts and the mature monocytes; these have been classified as "immature monocytes." The oxidase stain showed a few granules in the typical monocytes and some of the lobulated monocytes, but the blasts and immature monocytes were negative.

The patient was treated with intramuscular liver extract, but this had no effect. The anaemia, the white cells, and the proportion of monocytes steadily increased, as shown in Table I. The increase of the white cells was chiefly due to the appearance of large numbers of the lobulated monocytes. There was some vomiting; the patient gradually weakened and died ten days after admission. No ulceration of the mouth or throat developed.

TABLE I.—*Blood Counts of Case 1*

Days	0	4	7	10
Red cells, 10^6 per c.mm.	1.090	1.080	1.030	0.890
Haemoglobin, per cent.	30	28	24	20
Colour index	1.36	1.30	1.20	1.01
White cells, per c.mm.	14,000	27,700	54,400	65,400
Polymorphs, per cent.	0.25	0.25	0.25	0.25
Lymphocytes, per cent.	2.75	2.75	3.0	1.75
Monocytes, per cent.	49.75	55.25	69.0	86.5
Eosinophils, per cent.	nil	nil	nil	nil
Basophils, per cent.	nil	nil	nil	nil
Myelocytes, per cent.	nil	0.5	1.5	0.25
Immature monocytes and monoblasts per cent.	47.25	41.25	26.25	11.25
Nucleated red cells, per 400 W.B.C.	1	2	1	nil

Post-mortem Examination (Dr. J. Davson).—The femoral bone marrow was hyperplastic, pinkish brown in colour, with haemorrhages in parts. The heart was of the normal size, but there were marked purpuric haemorrhages on the anterior surface of the ventricles; the myocardium was pale and showed tabby-cat striation on the columnae carneae. In the right lung the upper lobe was consolidated and showed the appearance of grey hepatization; the lower lobe was congested and oedematous. The left lung showed some oedema and congestion, with pus in the bronchi of the lower lobe; the upper lobe was healthy. The liver (1,200 grammes) was pale and fairly firm; there was marked mottling due to passive congestion, and free iron was abundant. The spleen (100 grammes) was of normal size, consistency, and colour; on section it showed a purplish mottling on a light-brown ground, and the iron reaction was marked. The other organs showed no noteworthy abnormalities.

Microscopical Examination.—The bone marrow was not very hyperplastic; fat spaces were present everywhere, with small cellular patches and patches of haemorrhage between them. The cells were chiefly: (1) monocytes with very lobulated nuclei; (2) cells with much larger vesicular nuclei with two or three lobes—large monocytes; and (3) cells with non-lobulated vesicular nuclei and a fair amount of pale-blue cytoplasm—immature monocytes and monoblasts. Eosinophil myelocytes were seen occasionally, and a neutrophil or eosinophil polymorphonuclear rarely. Lymphocytes were present in small numbers. No megakaryocytes and hardly any nucleated red cells were seen.

In the spleen the Malpighian bodies were hardly visible. The pulp was very cellular; monocytes with lobulated nuclei were numerous and blast cells were also common; there was usually one myelocyte or polymorphonuclear cell—neutrophil or eosinophil—in each oil-immersion field. The reticulum cells with elongated nuclei and clearly defined processes were unusually prominent.

TABLE II.—*Blood Counts of Case II*

Days	1	4	5	6	8	11	14	22	27	44	86
Red cells, 10^6 per c.mm.	4.130	—	—	4.040	—	—	5.310	5.110	5.330	4.980	4.146
Haemoglobin, per cent.	53	—	—	53	—	—	71	71	88	82	80
Colour index	0.65	—	—	0.66	—	—	0.67	0.69	0.81	0.82	0.98
White cells, per c.mm.	8,200	21,200	32,500	24,000	23,000	22,200	7,500	6,600	7,400	9,600	5,600
Polymorphs, per cent.	34.25	23.0	—	23.0	25.5	33.25	33.25	41.0	53.0	40.75	58.0
Lymphocytes, per cent.	30.75	38.0	—	29.5	40.5	46.25	46.5	45.75	37.25	48.5	30.75
Monocytes, per cent.	6.75	5.0	—	4.25	3.25	1.75	4.25	5.5	7.25	8.25	7.75
Eosinophils, per cent.	0.25	0.5	—	nil	nil	1.0	2.0	1.75	1.0	1.25	2.25
Basophils, per cent.	0.5	0.25	—	0.25	0.5	nil	0.5	0.75	0.5	0.25	1.25
Myelocytes, per cent.	0.5	0.5	—	1.5	1.25	nil	nil	nil	nil	nil	nil
Abnormal mononuclears, per cent.	27.0	32.75	—	41.5	29.0	17.75	13.5	5.25	1.0*	1.0*	nil
Nucleated red cells per 400 W.B.C.	nil	2	—	3	1	1	nil	nil	nil	nil	nil

* Türck cells.

In the liver some fatty changes were present in the cells at the centres of the lobules. No definite leukaemic infiltration was manifest, though the blood vessels could be seen to contain lobulated monocytes.

Case II.—Infectious Mononucleosis

A female shop assistant aged 21 was admitted on account of haemorrhage from the rectum. The history was that from the time of the onset of menstruation at the age of 14 she had bruised easily; bleeding from cuts had been unusually free, and dental extraction had also been complicated by haemorrhage. Menstruation was irregular, and there was usually considerable loss. She had always been pale, but during the last few weeks her pallor had become noticeably intensified. Fourteen days before admission there had been a quite considerable haemorrhage from the rectum after defaecation; she had felt unusually tired, and had been obliged to stop work and go to bed a week later. Some haemorrhagic spots had appeared on the lips, which had bled a little, but there had been no further haemorrhage from the rectum or elsewhere, and no rash. No dyspnoea or palpitation was noted, but her appetite had been poor. The bowels were constipated, but micturition was normal. There had been slight loss of weight. For the last week she had felt unusually languid, and there had been much sweating. The previous medical history included rheumatic fever and scarlet fever at the age of 7.

Clinical Examination.—The patient appeared thin but not wasted, pale, and white. There were numerous small haemorrhages on the lips, but the tongue was clean and the teeth were good. The tonsils were congested but only slightly enlarged, and the throat was slightly congested. The skin was pale and damp; no rash was seen. The pulse was regular and of good volume, its rate being 96; the temperature was 101° F. The spleen was not palpable and the liver not enlarged. No enlarged lymph glands were found. The heart was not enlarged, but there was an apical systolic murmur; the blood pressure was 110/70 mm. Nothing abnormal was found on examination of the lungs and the central nervous system; the urine was free from pathological constituents. The blood count showed: red cells, 4,130,000 per c.mm.; haemoglobin, 53 per cent.; colour index, 0.65; white cells, 8,200 per c.mm.; polymorphonuclears, 34.25 per cent.; lymphocytes, 30.75 per cent.; monocytes, 6.75 per cent.; eosinophils, 0.25 per cent.; basophils, 0.5 per cent.; myelocytes, 0.5 per cent.; abnormal mononuclears, 27 per cent.; nucleated red cells absent; platelets, 494,000 per c.mm. The abnormal mononuclears were of two types (Figs. 4 and 5 on Special Plate): (1) large cells with a large nucleus either round or bean-shaped, with a stippled chromatin pattern, the cytoplasm being dark blue and ranging in amount from fairly abundant to scanty; and (2) cells equally large, with round nuclei whose chromatin had a less well-marked pattern and whose cytoplasm was pale grey-blue with a few azure granules and vacuoles. The first type looked like exaggerated Türck cells; the second type resembled exactly the immature monocytes seen in Case I. About 60 per cent. of the abnormal mononuclears were of this second type. There were cells which it was difficult to place in either type and, in consequence, all were classified together as "abnormal mononuclears."

The Wassermann reaction was negative. The van den Bergh test showed 0.3 unit of bilirubin. Cultures from a throat swab showed that no diphtheria was present; haemolytic streptococci and *Staphylococcus albus* were found.

Treatment with pil. ferri 90 grains daily was commenced at once. On the fourth day after admission the patient complained of sore throat, and there was some swelling of the cervical and axillary lymph glands and of the tonsils; the temperature was now normal. The blood count (see Table II) showed that the white cells had risen to 21,200 per c.mm., with 32.75 per cent. of abnormal mononuclears. By the eighth day her condition was much worse. The temperature was 101° F.; the tonsils were very swollen, especially the left, which showed excavation on the surface and exudation. The lymph glands all over the body were enlarged. The blood count was much as before. From this day, however, recovery set in, and ten days later the swelling of the tonsils had almost completely subsided. The lymph glands were no longer enlarged and the temperature was normal; the white cell count had fallen below 10,000 per c.mm. and there was only a small percentage of abnormal mononuclears. The Paul-Bunnell test (1932) at this time gave a result (positive in a dilution of 1 in 16) which was compatible with an infectious mononucleosis that had passed the acute stage. Twenty-three days after admission she was discharged to the department's out-patient clinic, treatment with iron being continued. During her time in the ward there had been no rectal haemorrhage or other bleeding, except from the lips, and this had now ceased. She continued to recover, and the blood returned towards normal levels.

Case III.—Infectious Mononucleosis

A glass-bender aged 24 was admitted with the history that fourteen days previously he had noticed some swellings in the neck and under the left jaw; those under the jaw were tender. He felt tired, but continued at work. One week later he had a severe attack of griping pain in the left hypochondrium, and at the same time he complained of sore throat and dysphagia. No haemorrhages occurred: there was no rash, and she had no cough. The bowels were constipated and micturition was normal. Since both these symptoms became worse he obtained medical advice. A blood examination showed that there were 19,200 white cells per c.mm., of which 92 per cent. were reported as lymphocytes.

Clinical Examination.—On admission to the Infirmary he had a good colour and was rather flushed and well nourished;

he found it painful to speak or to swallow. The tongue was furred and dry, the teeth were good, and the tonsils were red, but not enlarged or ulcerated; the throat was injected and oedematous, but no ulcerations were present. The temperature was 101° F., the pulse regular, rate 95. All the groups of lymph glands in the neck were enlarged and the glands were discrete, movable, and about 2 cm. across; there was a larger mass in the left submaxillary region, which was tender but not fluctuant. The occipital and parotid glands were enlarged; a few glands were palpable in the axillae, and one large gland was present in each inguinal region. There was some tenderness in the left hypochondrium; the spleen was not palpable and the liver not enlarged. Examination of other systems revealed nothing of note. The blood count showed: red cells, 4,890,000 per c.mm.; haemoglobin, 94 per cent.; colour index, 0.96; white cells, 16,800 per c.mm.; polymorphonuclears, 13.5 per cent.; lymphocytes, 64 per cent.; monocytes, 6 per cent.; eosinophils and basophils absent; abnormal mononuclears, 16.5 per cent.; nucleated red cells absent. The abnormal mononuclears were mostly of the type with large nuclei and dark-blue cytoplasm. The Wassermann reaction was negative; the Widal reaction was negative for all standard antigens; the Paul-Bunnell test was positive in a

TABLE III.—*Blood Counts of Case III*

Days	0	5	8	12	30
Red cells, 10^6 per c.mm.	4.890	—	—	5.140	4.160
Haemoglobin, per cent.	94	—	—	98	90
Colour index	0.96	—	—	0.96	0.98
White cells, per c.mm. ...	16,800	8,300	10,000	9,800	5,600
Polymorphs, per cent. ...	13.5	9.0	13.5	23.0	32.75
Lymphocytes, per cent. ...	64.0	76.25	67.0	65.0	56.25
Monocytes, per cent. ...	6.0	5.5	9.0	8.5	8.75
Eosinophils, per cent. ...	nil	0.25	nil	nil	1.25
Basophils, per cent. ...	nil	0.5	0.25	nil	1.0
Abnormal mononuclears per cent.	16.5	8.5	10.25	3.5	nil

dilution of 1 in 128 (which the authors regard as almost certainly diagnostic of infectious mononucleosis).

From the time of his admission the patient steadily improved, the glands became less swollen and tender, the throat less painful, and the blood counts showed a return to a more normal picture. He was discharged after twelve days feeling quite well, although the blood count, as usual, still showed some mononucleosis.

Discussion

The three cases described seem to form examples of a graduated series, Case I being typical of monocytic leukaemia, Case III characteristic of glandular fever, while Case II shows features of both. Case II presented unusual features; haemorrhage of any sort is rare in infectious mononucleosis, and Tidy (1934) states that he has only been able to trace one case where there was haemorrhage from the rectum. The white cell count reached a high level, nearly to Tidy's maximum of 40,000 per c.mm.

Differential Diagnosis

In characteristic cases, such as exemplified by Cases I and III, the differential diagnosis presents little difficulty. The patient with acute leukaemia is severely ill, there is marked anaemia, and a high proportion of the leucocytes are recognizably immature. The patient with glandular fever has an illness which is clinically mild, there is no anaemia of any significance, and although there is a mononucleosis only a small proportion of the cells can be interpreted as immature.

In less typical cases the diagnosis may present great difficulty. Both conditions may show pyrexia, enlarged lymph glands, and an enlarged spleen. Mouth lesions and sore throat, not part of a leukaemic syndrome, may be accompanied by a mononucleosis (Friedmann and Elkeles, 1928; Hartfall, 1934). Case II shows that haemorrhage and anaemia may occur in infectious mononucleosis as well as in leukaemia; but the anaemia of acute leukaemia, except in the early stages, is usually more severe than in Case II. The total white cell count is no guide; the majority of cases of acute leukaemia have white cell counts under 40,000 per c.mm. and many are under 10,000 per c.mm. (Israëls, 1936). The morphology of the mononuclears is, however, usually very helpful, and this, together with the clinical impression of the illness, are the most useful points. The recent "heterophil antibody" tests introduced by Paul and Bunnell (1932 and 1933) also seem to be promising.

Morphology of the Mononuclears

Longcope (1922), describing infectious mononucleosis, wrote that the mononuclears were of three types: normal lymphocytes, large cells identical with the "large mononuclears and transitional cells of normal blood," and mononuclears of a type not encountered in normal blood. Further experience of the disease has confirmed the accuracy of this classification, and although all three varieties are increased in number in infectious mononucleosis, attention has been particularly directed to the abnormal mononuclears, since they give a valuable diagnostic clue. As stated previously (Case II), there are two chief varieties: (1) large cells with large round or bean-shaped nuclei and scanty to fairly abundant dark-blue cytoplasm, and (2) equally large cells with large round nuclei with pale grey-blue cytoplasm. Transitional forms between these two occur. American writers (Sprunt and Evans, 1920; Longcope, 1922; Downey and McKinlay, 1923; and Baldridge *et al.*, 1926) have usually interpreted them all as lymphocytes, Wiseman (1936) regards infectious mononucleosis as an infective hyperplastic lymphatic condition; certain German authors (Baader, 1922; Hopmann, 1923) regard them as monocytes. More recently in this country Whitby and Britton (1935) think that they are all monocytes, while Tidy (1934) is of opinion that both lymphoid and reticulo-endothelial tissues are involved. On the whole it seems likely, however, that both abnormal lymphocytes and immature monocytes occur. In the figures of Downey and McKinlay (1923) and of Baldridge, Rohner, and Hansmann (1926) there are cells which to-day would almost certainly be interpreted as immature monocytes, though at the time when these papers were written the conception of monocytic leukaemia, with the knowledge it gave of the characters of immature monocytes, was not widely known. The finding in Cases I and II of this series of very similar, if not identical cells, corresponding to the second type of abnormal mononuclears mentioned above, also suggests that these are immature monocytes. With regard to the first type of abnormal mononuclears there seems to be no means of deciding definitely whether they are lymphoid or monocytoid; supravital staining, as Tidy (1934) and Hall (1930) have pointed out, gives no more evidence than other methods. They are different from the monoblasts, as seen in Case I, and from myeloblasts, being usually larger and with a greater quantity of darker-staining cytoplasm and a different nuclear pattern; Downey (1923) gives reasons for regarding them as lymphoid.

In making the counts no attempt has been made to classify these cells because, as Baldridge puts it, "any attempt at dividing the cells into groups leads to stilted classifications based on slight morphological differences and varying with different observers," and also because

these differences are not reflected clinically. The proportions of normal lymphocytes, normal monocytes, and abnormal mononuclears seem to vary from case to case: sometimes the monocytoid cells are prominent, sometimes the lymphoid cells. But it may be said that, if the clinical picture is suggestive, the presence of a mononucleosis which includes a significant proportion of the abnormal mononuclears described makes it very likely that the condition is infectious mononucleosis.

Apart from causing diagnostic difficulties it is of great interest that immature monocytes should appear in an apparently infective state as well as in a leukaemic state. It is well known that in septicaemia myelocytes may appear in the blood, and that whooping-cough often causes a lymphocytosis of leukaemic proportions. It is possible that the relation between the monocytosis of monocytic leukaemia and glandular fever may be similar, thus bringing the monocytic series into line with the other series of leucocytes. At present there is no evidence as to the nature of the relation between this type of response and that of leukaemia.

Summary

1. A case of monocytic leukaemia and two cases of infectious mononucleosis (glandular fever) presenting different clinical and haematological characters are described.

2. In infectious mononucleosis mononuclear cells of types not found in normal blood appear. These cells are described, and it is suggested (by comparison with the cells in monocytic leukaemia) that some of them are immature monocytes and that others are probably lymphoid. These cells are very typical, and are of considerable value in diagnosing the condition.

3. The differential diagnosis between monocytic leukaemia and infectious mononucleosis is considered.

I am glad to acknowledge assistance I have received from Dr. J. F. Wilkinson and other members of the honorary staff of the Manchester Royal Infirmary who have allowed me access to cases under their care; from Professor Dougal for the loan of apparatus; and from the Lady Tata Memorial Trust Fund.

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The tenth congress of oto-neuro-ophthalmology will be held at Geneva under the presidency of Professor F. Naville from May 14 to 16, when papers will be read on the central vestibular tracts and their disorders by Professor Van Gehuchten of Louvain, and on topographical syndromes of these tracts by Professor J. A. Barre of Strasburg. Further information can be obtained from M. Edmond Barbey, 20, Rue du Général-Dufour, Geneva.

TERMINAL CASEATING TUBERCULOUS BRONCHOPNEUMONIA

IN WHICH THE DATE OF ONSET WAS KNOWN

BY

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(WITH SPECIAL PLATE)

In any subacute or chronic tuberculous lesion found at necropsy data are rarely available for fixing the time at which the pathological process began. As a rule this can only be inferred from the time at which signs or symptoms were first noticed. By how long the pathological changes had preceded these it is usually impossible to say. In the case which is here recorded it so happened that data were present for fixing within narrow limits the time of onset and consequently the rate of development of gross tuberculous lesions in the lungs.

Pathological Evidence

On August 20, 1936, a necropsy was made on a man, 45 years old, who had been a patient of the South Yorkshire Mental Hospital for nine years. The body was extremely emaciated. A large area of tuberculous bronchopneumonia was found occupying the upper and middle zones of the left lung, and there was a rather smaller area in the right lung in the same parts (see Special Plate, Figs. 1 and 2).

The presence of such gross and extensive lesions in the lungs came as a surprise, because although tuberculosis had been suspected in this man for some years, owing to his progressive wasting, yet at no time had any abnormal physical signs been found in the chest. Even as recently as July 2, 1936—that is, less than two months before death—not only had no abnormal physical signs been found on careful examination, but also an *x*-ray film of the chest had shown nothing definitely abnormal (Fig. 3). One must therefore suppose either that almost the whole of this extensive invasion of the two lungs had developed since July 2, 1936, or that there were at that date marked tuberculous changes in the lungs which not only gave rise to no obvious physical signs even when carefully sought for, but which also showed no evidence of their presence on *x*-ray examination.

It would be contrary to all our radiological faith to believe that any gross focus of tuberculosis could have been present in these lungs at the date at which this radiograph (Fig. 3) was taken. It therefore follows that almost the whole of the areas of solidification and cavitation found at the post-mortem examination must have developed during a period of some fifty days or less; how much less it is impossible to say.

Mention has already been made of the extreme emaciation of the body at death, and of the fact that this loss of flesh had been going on for six years, so as to cause repeated suspicion of tuberculosis. The explanation of this wasting is found in the records of the case. The man was a melancholic, with strong suicidal tendencies, and had acquired the habit of regurgitating a considerable part of every meal. Nothing could be done to prevent this. The wasting was thus due to gradual self-starvation, brought about by the psychosis.

Presumed History of Infection

The actual order of events would thus seem to be as follows. He probably received his tuberculous infection in early life, as most do, and was left with a latent focus which could not be recognized. There is a statement in his notes that he had influenza in November, 1918 (when one of the greater epidemic waves was present), and that after that, in May, 1922, he began to show mental symptoms, but no recognizable spread of tuberculosis took place either then or up to July, 1936.

It seems that when the wasting brought about by his self-induced starvation had reached a certain point the old original focus, no longer held in check, spread rapidly, involving a great part of both lungs within some fifty days. That there was a complete lack of resistance or reaction is shown by the fact that during the six months before his death the temperature, taken night and morning, was only above normal on four single occasions, and that during the last three weeks of life, when this rapid spread must have been taking place, it was never raised above normal at any time. This seems to be a rather striking example of an endogenous metastatic reinfection by the tubercle bacillus from within the body, due to severe loss of resistance. As Davidson (1935) states: "Such reinfection being commonly preceded by a lowered resistance on the part of the individual."

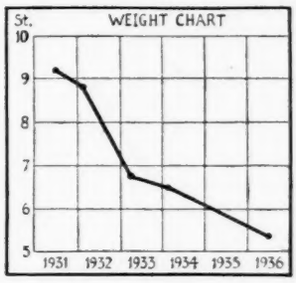
Indirectly the course of events in this man was of interest from another point of view—namely, as to whether he, like other persons with sufficiently lowered resistance, might have received a reinfecting dose from without. In mental hospitals and other institutions where numbers of persons are living together this possibility has always to be borne in mind, and special care is taken to remove all known cases of tuberculosis to a special block. This man had been bed-ridden for many months, and had not, during that time, been in contact with any known case of tuberculosis. The possibility, therefore, of reinfection from without was minimal. The most likely source of the sudden spread of tuberculosis in the lung seems to have been the caseating hilar gland found at the root of the right lung (Fig. 1). Possibly it had ulcerated through to a bronchus with a resulting "aspiration-pneumonia."

Notes of Case

The patient was admitted to the South Yorkshire Mental Hospital on July 2, 1929. He had had influenza in November, 1918, and had been showing mental symptoms since May, 1922. His father was alcoholic, otherwise the family history was negative. No abnormal physical signs were found in the chest on admission. He was suffering from melancholia, was depressed and apprehensive, said he was unfit to live, and was actively suicidal. His desire for death found expression in a habit of regurgitating food. After his meals he used to put his finger in his throat and induce vomiting. If restrained from doing this he became very resistive and threatened to do harm to himself. He lost weight steadily. In June, 1931, he weighed 9 st. 2 lb.; in February, 1932, he weighed 8 st. 12 lb.; in March, 1933, 6 st. 11 lb.; in February, 1934, 6 st. 7 lb.; and in June, 1936, 5 st. 5 lb. (See Chart.) It was impossible to induce him to retain his food.

On June 7, 1936, a complete physical examination was made, and the note on his condition reads as follows: "Heart sounds regular—no bruits. No lesion found in chest or abdomen. Remarkably free from bedsores, despite extreme emaciation." He had been in bed since July, 1930. On sunny days he was nursed on the veranda. There was no cough or sputum. His temperature was taken morning and evening, and was charted from February 19, 1936, until his death in August of that year. On only four occasions was the temperature above normal. During the last three weeks of his illness there was no pyrexia at all. His pulse rate was between 60 and 70 throughout, and his respiration rate ranged from 18 to 22 per minute.

The differential white cell count, taken on June 29, 1936, showed: polymorphonuclears, 82 per cent.; lymphocytes, 17 per cent.; and large hyaline cells, 1 per cent. A specimen of his urine on June 9 contained a trace of albumin and an occasional granular tube cast. The faeces were tested for tubercle bacilli on June 8 and 15, with negative findings. The chest was radiographed on July 2, 1936. The report reads as follows: "Heart normal in size and position. Hila both slightly enlarged. The apices light up fairly well, the left



better than the right. There is slight fibrosis present over the whole of both lungs, but no active mottling anywhere." A note on August 16 stated: "Is slowly degenerating both mentally and physically. Appears very feeble at times—still vomits after his meals."

He died on August 20, and a post-mortem examination was made on the same day. The body was emaciated.

The pleura over the left lung was normal. The lower part of the upper and upper part of the lower lobes were solid. This area was clearly demarcated; it involved almost the total horizontal section of the lung, and measured 5 in. vertically. Many areas up to 1/2 in. diameter of caseation were present in the consolidation. These areas had resulted in softening and cavity formation, and there was a marked absence of fibrotic tissue. The cavities contained thick green necrotic material; a film of this material, stained by the Ziehl-Neelsen method, revealed a profusion of tubercle bacilli. A section of the consolidated area stained with haemalum and eosin showed a diffuse caseation of the involved area of lung. There was no overgrowth of fibrous tissue, and no giant-cell systems were seen. There were numerous alveoli containing only fibrin. The section stained by the Ziehl-Neelsen method showed numerous tubercle bacilli.

In the right lung there were areas of trefoil necrosis in the middle lobe and the lower inch of the upper lobe, but there was considerable spongy lung substance still present in the affected zone. Over the diseased area of this lung there were small patches of thickened pleura and a certain amount of comparatively recent pleurisy. There were also three small areas the size of a pea in this lung which had a little fibrous tissue reaction and a few giant-cell systems, and only in these small areas of the widely involved area in both lungs was the disease probably as much as a few months old. At the root of the right lung there was a solitary caseous peribronchial gland, half an inch in diameter; it was darkly pigmented and distended with caseous material, and appears to have been the primary focus. The heart and kidneys were much atrophied. There was no gross lesion of the stomach. There was no dissemination of tuberculosis throughout the body.

Acknowledgements

I am indebted to Sir Arthur Hall for his stimulating advice, to Dr. J. L. Grout for his opinion on the films taken and reported by Dr. E. M. Sykes, and to Mr. W. Vincent for the photographs. I should like to express my thanks also to my colleagues who made the clinical notes, and to Dr. Arthur Pool, medical superintendent of the South Yorkshire Mental Hospital, for permission to publish the case.

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CARCINOMA OF THE BRONCHUS IN A BOY AGED 19

BY

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(WITH SPECIAL PLATE)

The occurrence of carcinoma of the bronchus at the age of 19 is rare enough to be worthy of record. This condition usually occurs between the ages of 40 and 70 (Simpson, 1929), although several younger cases have been reported. Many writers have published series of cases of intrathoracic neoplasms with the age incidence.

Cases in the Literature

I have collected all the reported series of cases which could be found in the literature, after an exhaustive search, and compiled the following table to show the age of incidence.

Age	0-20	21-30	31-40	41-50	51-60	61-70	71-
Cases (2,110) ...	20	89	290	576	726	341	68
Percentage ...	0.95	4.22	1 .74	27.3	34.41	16.16	3.22

These include series collected by Hill (1934), Harvey (1936), Rosedale and McKay (1936), Kramer and Som (1936), Arkin and Wagner (1936), McCrae, Funk, and Jackson (1927), Wasch and Epstein (1935), Rogers (1932), Atkin (1931), and Duguid (1927).

This table shows that the incidence is highest between the ages of 51 and 60—namely, 34.41 per cent. Over 60 per cent. of all cases occur between the ages of 40 and 60. Less than 1 per cent. occurred below the age of 20. Unfortunately no attempt has been made in these series to relate the pathological diagnosis to the age of the patient, and it is possible that some of the younger patients have been suffering from lymphosarcoma or Hodgkin's disease rather than carcinoma. Two of the writers, however, made observations of interest.

Bonser (1929) reported 170 cases of intrathoracic neoplasms, of which six patients were under the age of 21. She stated that two of the six were suffering from Hodgkin's disease, but the other four were not classified. The other writer is Atkin (1931), who from a survey of ninety-three cases suggested that oat-cell carcinoma tended to occur at an earlier age than squamous-cell carcinoma. In his series three patients were aged under 30 (the youngest being 21); each of these cases proved to be oat-cell carcinoma.

Clinical Record of Case

A boy electrician, aged 19, had had no previous illnesses and did not suffer from bronchitis: the family history was good. There was no history of familial tuberculosis. When first seen, early in June, 1936, he complained of cough, sputum, night sweats, and loss of weight. These symptoms dated from a cold, and had been present for some three months. On examination little could be found in the chest other than a few crepitations at the left apex. The patient was referred to the tuberculosis officer for examination; an *x*-ray film of the chest revealed no evidence of tuberculosis, but there was a faint rounded shadow in the left apex.

A fortnight later the patient was admitted to the Liverpool Royal Infirmary. Progress of the disease during this time had been rapid. The patient was now thin and emaciated; he had a cough and slight sputum, but no haemoptysis. Large distended vessels were present on the chest and abdominal walls. There was some cyanosis, but the neck was not distended and the cough was not typical. Several small secondary nodules were present on the chest and abdominal walls, each about the size of a marble; they were situated in the superficial tissues, and were freely movable. The liver was hard and enlarged, extending as far as the umbilicus. The left side of the chest showed diminished movement, diminished vocal fremitus and vocal resonance, a dull percussion note, and diminished air entry with bronchial breathing at the apex. These signs were most marked at the apex, but were present to a less degree at the base. Examination of the sputum was negative.

X-ray examination of the chest revealed a large mass extending out from the left root into the lung with collapse of the lung due to bronchial obstruction. An *x*-ray examination after the introduction of lipiodol showed obstruction of the left bronchus due to a bronchogenic neoplasm. These *x*-ray films are reproduced (Special Plate). Following this discovery one of the metastases was removed from the chest wall, under local anaesthesia, for section. The pathological report was metastasis from oat-cell carcinoma of bronchus.

The patient went downhill rapidly, and died six weeks after admission to hospital. Unfortunately permission for a post-mortem examination could not be obtained. The diagnosis had, however, been fully settled by the metastasis removed for section.

Commentary

The main point of interest is, of course, the age of the patient. Other points to note are the complete absence of any aetiological factor and the similarity to pulmonary tuberculosis in the early stages. The differential diagnosis from this disease would have been impossible in the early stages without an *x*-ray picture, although later the diagnosis became obvious.

A final matter of interest was the occurrence of subcutaneous metastases, which are uncommon in this form of malignant disease, although metastases in general are common. In this connexion it may be pointed out that in a total of 420 cases, collected by Bonser (1929), Grove and Kramer (1926), and Maxwell (1930), in which the occurrence and site of metastases are reported, only nine cases showed involvement of the subcutaneous tissues.

My thanks are due to Dr. Wallace Jones for permission to publish this case, and to Dr. Hewer for his help with regard to the pathology.

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G. A. Metz (*Nederl. Tijdschr. Geneesk.*, January 30, 1937, p. 493) records the case of a man, aged 45, who developed symptoms of acute veronal poisoning after taking 9 grammes of veronal. Treatment consisted in administration of strychnine nitrite, of which sixty-six intravenous injections of a total of 599 mg. were given in the course of eight days. Delirium of six days' duration set in eight days after taking the drug, but subsequent recovery was uneventful. Traces of veronal persisted in the urine for fourteen days after it had been taken.

INDUSTRIAL ASPECT OF FRACTURES OF THE OS CALCIS*

BY

BRYAN McFARLAND, M.D., F.R.C.S.Ed.

(WITH SPECIAL PLATE)

From an industrial point of view the os calcis presents a problem as important as it is complex. Excluding those in children, two out of every hundred fractures in the body involve the os calcis and occur in wage-earning men at a time when they have dependent families and can least afford the loss which may follow such an injury.

TABLE I

Age	Percentage of Total (63)	Age	Percentage of Total (63)
10-15	2	45-55	25
15-25	1	55-65	17
25-35	15	65-75	7
35-45	33		

Note nearly 60 % between the ages of 35 and 55 years.

My own experience indicates that the loss as regards money and physical condition is very considerable, and I wondered what others had found. Investigation of the literature confirmed my gloomy view.

Previous Literature

Golebiewski (1897) stated that he had not seen a perfect recovery in any of fifty-nine cases. Cotton (1908) reported permanent disability in more than 50 per cent. of examined cases. In 1923 Magnuson reported that in his capacity as medical director of the Illinois Industrial Commission he had seen practically no case of fracture of the os calcis which did not result in from 30 to 75 per cent. disability of the foot. In 1923 also Satta stated that the disability from fractures of the os calcis might amount to as much as 80 per cent. He added that in Switzerland the insurance companies settle these cases on a basis of one-third total disability for a period of from two to four years.

Malpas (1925) investigated the period of disability in a series of fractures at the David Lewis Northern Hospital. In most of these cases no definite attempt at reduction of the fractures was made. Malpas found that at that time the average period of disability was eleven months, and from a comparatively small number he concluded that irregularity of the subastragaloid joint was the deciding factor. Harding (1926) estimated the average duration of disability as five months. Otto J. Herman (1930) reported good result in 77 per cent. and a poor result in 22 per cent. Funston and Hall estimated the average disability period as six months.

In 1931 Bartley wrote: "All surgeons of much industrial experience and all industrial compensation boards are unanimous in giving to this injury a very bad prognosis." His figures tend to show difference between the disability period of comminuted fractures which enter the subastragaloid joint and those which do not. He performs a subcutaneous tenotomy of the tendo Achillis and almost immediate subastragaloid fixation. He cites as a specially good result the case of a man who went back to his occupation in five months' time. He does not specify his occupation, though since he fell from a roof it is probable that he was either a builder's labourer or a slater, or possibly a private detective. It appears that the man could support the weight of his body upon the ball of the foot and also on the heel. But rather naïvely the surgeon remarks: "There was no defect in any of the motions of the foot or ankle except the loss of *eversion* and *inversion*."

In 1932 Rudolph S. Reich stated that fractures of the calcaneus still resulted in permanent disability in a discouragingly large proportion of cases. He reported ten recent fractures, the treatment of which involved a subcutaneous elongation of the tendo Achillis, and six weeks later a subastragaloid fixation; the most fortunate of these patients was back at work in six and a half months. The average for most of the others was eight and a half months: one was not back at work after two years, and was then still complaining of pain. One was ten months before he went back. After two years three of them were on light work only. The curious point is that in nine old fracture cases there was a disability period following operation of about the same duration as the recent fracture cases—namely, six and a half months to ten months or a year. Nevertheless, the case of a man he had operated on eleven months previously was mentioned as being too recent to report. Wilson (1933) recorded the results of fifteen recent fractures, not all crush fractures into the joint, but did not indicate the disability period nor the amount of permanent incapacity.

Forrester (1934), referring to the cost of this type of fracture, reported that before his newer type of treatment the average disability was from nine to sixteen months. Permanent disability was about 80 per cent. He claimed to have reduced the period of disability to four and a half months. He elongates the tendo Achillis and keeps the patients off their feet for some time. It is difficult to assess his results, because all his unselected cases have the same period of disability—four months—and their functional end-result is 100 per cent. It is rather difficult to determine from his *x*-ray illustrations how bad the fractures were. Böhler does not denote his exact periods, but is reported to have said that about 80 per cent. of his patients got back to heavy work, though this may be delayed for as long as two years.

At a North American meeting one speaker was very illuminative; he remarked that he had treated fractures of the os calcis in every way that had been devised, and that he knew of no injury which produced as much disability. He usually had a patient under his care anywhere from nine months to a lifetime, and they often never went back to work.

Estimations of Cost

All authorities agree that the cost is high. The total economic loss is made up of four items: (1) cost to the insurance companies; (2) cost to the men; (3) cost to the hospitals; and (4) physical deterioration.

I tried to obtain estimates from insurance companies. On approaching several large companies I was invariably referred to the Accident Offices Association in London, where I learned, as I had been advised also by the insurance companies, that they were not actually interested in fractures individually, but in types of work. For instance, they insure a firm, not against fractures of the os calcis, but against any injury. For their own sakes their statistics are concerned in the accident rate of a particular occupation rather than in the period of disability of any specific injury. The same is not true of a firm which carries its own insurance, but even they have little exact knowledge of the cost to them of a fracture of the os calcis.

* The opening paper of the annual meeting of the British Orthopaedic Association at Manchester.

Owing to a series of changes in hospital appointments, I have few personal figures which I am at liberty to use, but I have investigated the patients who have attended my present hospital during the last five years. The following is a table showing their occupations, the average duration of incapacity, the percentage of permanent incapacity, and the proportion of the total who were rendered permanently incapacitated for work.

TABLE II

Occupation	No.	Average Duration of Incapacity	Percentage of Permanent Incapacity
Labourers	24	1½ years (in 25%)	50
Scalers...	2	6 months	15
Painters	2	6 months	10
Window cleaners	4	1 year (in 50%)	30
Bricklayers	2	2 years	40
Coal heavers	2	—	80
Stevedores	2	—	80
Housewives	4	5 months	10

Note the large proportion of labourers and how long their average duration of incapacity was; many of them remain permanently disabled. The bulk of the permanently disabled fall into this category.

Bad as these figures are, they are not so bad as those in the next table, taken from patients referred to me for a medical report for legal purposes. The disability period had to be estimated as a minimum, and it will be seen how heavy this minimum is, the average being well over one and a half years.

TABLE III

Occupation	Number	Average Minimum Period of Disability
Builder	3	13 months
Boilermaker	1	19 ,,
Chauffeur	1	19 ,,
Labourer	5	13 ,,
Marine fireman	1	9 ,,
Haulage contractor	1	21 ,,
Carter	2	9 ,,
Painter	2	19 ,,
Joiner	2	19 ,,
Shipwright	1	24 ,,
Unknown	2	21 ,,

I estimate the average cost of an os calcis fracture as follows:

1. Cost to the insurance companies £150
2. Cost to the men... 75
3. Cost to the hospital 20

} About £250.

4. Physical deterioration cannot be estimated.

Factors in the Protracted Disability

Let us consider what gives rise to this long, costly disability. We are taking for granted that fractures such as that shown in Fig. 1 (Special Plate), and also crack fractures without displacement or involvement of the subastragaloid joint, recover comparatively quickly, with little or no permanent defect. It is with the type of fracture represented in Fig. 2 that we are concerned. There are many factors involved, medical and non-medical; they are interwoven to produce a complicated problem. One man who had sustained a typical fracture of both os calces seems to me the personification of the problem.

After reduction and splinting under an anaesthetic, followed later by manipulations, he complained of the usual symptoms. A surgeon acting for an insurance company arthrodesed his left subastragaloid joint (Fig. 3). Some time later I arthrodesed his right subastragaloid and mid-tarsal joints (Fig. 4).

His complaints were little if at all lessened. As far as external examination goes his feet look good. The foot in which the three joints were arthrodesed is better than the foot in which only the subastragaloid fixation was undertaken. He walks like a "cat on hot bricks," but a cinematograph analysis shows that all phases of walking are performed normally. Would this man have been any different if his feet had been arthrodesed at first?

This patient compares very unfavourably with another who sustained a similar injury to both feet, and whose clinical and cinematograph analysis suggested very little disability five months after injury. He was treated in a way I will describe later. Fig. 5 shows the *x*-ray result.

This first patient differs markedly also from a man who sustains a fracture of the os calcis when not at work. I remember an engineer who fell from a roof when "larking" in the dinner-hour. Both his os calces were crushed, and in three months he was back at full work. The same is partly true when a man is unaware of the fracture. I examined a man once who had a fractured femur and os calcis, though the latter had never been recognized. He was off duty for five months and returned to work, only complaining slightly of his heel.

The medical and non-medical factors referred to can roughly be divided into two groups:

1. Medical: (*a*) attitude of the surgeon; (*b*) subastragaloid arthritis; and (*c*) the type of treatment.

2. Non-medical: (*a*) unemployment; (*b*) influence of solicitors and doctors; (*c*) the type of man; (*d*) the type of his employment; and (*e*) the Workmen's Compensation Act. So far as one can disentangle the various medical factors, it is certain that a firm and carefully optimistic attitude on the part of the surgeon has important psychological effects.

Subastragaloid Arthritis

As regards my own observations and also as a result of investigating these hospital patients I have come to the conclusion that subastragaloid arthritis is not the deciding factor in the length of a man's unfitness or the severity of his permanent disability. The following radiographic reproductions and notes illustrate what I mean.

Fig. 6.—This *x*-ray picture was obtained three months after a comminuted fracture of the os calcis with displacement and involvement of the subastragaloid joint. The patient returned to work about four months after the injury. The treatment is described later.

Fig. 7.—In this case the patient was only off duty for six months. The *x*-ray illustration shows arthritis and deformity, yet he only had a short disability, and no symptoms at all five years afterwards. His cinematograph record shows no disability.

Figs. 8 and 9.—One side was noticed and treated; the other side was not noticed at the time, and was not treated. The patient has no symptoms at all in the untreated side. His *x*-ray films show that there is arthritis and deformity of an almost equal degree in both feet. He complains only of the one that was treated, and his cinematograph record supports this.

A lady sustained a very comminuted crush fracture of the os calcis with great displacement; she was treated in the way

described later. Her *x*-ray films six months later showed very considerable osteosclerosis. In the neighbourhood of the subastragaloid joint some deformity of the bone persisted. She was off work only for a short period. Her cinematograph analysis appeared normal. (Owing to lack of space it is impossible to reproduce the *x*-ray films.)

A man sustained a crush fracture of the os calcis which resulted in severe deformity and subastragaloid arthritis, but he had no disability. (Lack of space prevents reproduction of the *x*-ray films.)

Another man sustained a similar injury; *x*-ray films nine months after injury did not show any arthritis and very little deformity. He has a severe disability. (Lack of space again precludes illustration.)

Moreover, a subastragaloid arthrodesis does not necessarily stop their pain nor terminate their disability. The first patient recorded in this article affords one example, and another follows herewith.

Following a crush fracture a man had marked arthritis, shown in an *x*-ray film made on March 1, 1932. Some time later a subastragaloid arthrodesis was performed, and the result is indicated in an *x*-ray photograph taken on September 7, 1935 (Fig. 10), which also shows the amount of arthritis which has since occurred in the mid-tarsal joint. There was no improvement in his working capacity.

Treatment

I describe later my own preference. Over a number of years my observations have not led me to believe that there is much difference between the results of various other types of treatment.

Non-medical Factors

Unfortunately non-medical factors are very important, the type of man and of his employment being paramount. It is shown in Table II that a very large percentage were labourers, and that they had long periods of disability. Examples are given above of men with arthritis but no disability, and vice versa. I have come to the conclusion that from an economic point of view the type of person and his occupation matter more than the nature of the deformity or the presence of subastragaloid arthritis; a bad subject and heavy work forecasts a slow recovery, irrespective of arthritis; a good subject and good work indicates a quick recovery, even with deformity and arthritis.

Other non-medical difficulties are very great. A most difficult point to determine is whether a man is malingering. I think that these patients are rare. There is little to be gained to-day by malingering. Moreover, there is consistency in complaints from widely separated men and from men who do not know the nature of their injury. I have examined injured workmen for many years, and have found very little difference in the nature or extent of their complaints.

The typical complaints are as follows: (1) pain in the back of the heel; (2) pain on the outer side of the ankle-joint; (3) a feeling described as "toothache" in the pad of the heel; (4) a heavy, burning, bursting feeling in the main part of the sole of the foot; and (5) loss of spring—flattening of the heel and shortening of the leg. If a man has some disability he knows that he cannot return to work in fair competition with his fellows. Often too much is asked of him by the insurance company advised by a surgeon, and in response the man gives back the minimum. Sides are immediately formed. If we could avoid the formation of those sides and obtain close co-operation between the parties interested in getting the man back to work, I believe that we should enormously reduce the cost to everybody. The best results occur with men employed by firms who carry their own insurance, and who work in close liaison with the surgeon.

How far can we influence the non-medical disability factor? In two ways—by our attitude and by our treatment. A sympathetic but firm and hopeful attitude must be maintained and patients must observe others around them recovering. It is bad for a fresh "os calcis" case to meet an "old chronic" one. The men must feel that they will completely recover and return to work able to compete fairly with their fellows.

Treatment

I believe that a long period of complete absence of weight-bearing is essential. By absence of weight-bearing I do not mean walking in a plaster, because I do not believe that a man walking in a plaster fails to take his weight ultimately through his heel.

I see no point in elongating the tendo Achillis under an anaesthetic. More elongation can be obtained by bending the knee than by dividing the tendon. The following is the treatment which I advocate; I have found it hopeful.

With an anaesthetic the fractured bone is moulded with the hands or with mechanical pressure, and the heel is pulled down as far as possible, the knee being well flexed. Plaster-of-Paris is applied, the heel being inverted, the foot plantar-flexed, and the knee bent almost to a right-angle. The knee is included in the plaster. Weight-bearing is not allowed for two and a half months, but the men are encouraged to use their intrinsic muscles. This treatment is continued when the plaster is removed and before weight-bearing begins. Patients are allowed to get about with a crutch if only one os calcis is fractured, but if both are crushed they are unfortunately "laid by the heels."

The average period of disability of six patients so treated is four months. It is quite possible that they were all very good subjects, but cinematograph films show very encouraging results. Four were stokers and labourers.

Employers and insurers must co-operate with the surgeon. As soon as possible work should be provided on a non-competitive basis within the man's ability. In other words, rehabilitation schemes should be instituted. Whereas "centres" will be unpopular and unworkable, large employers of labour by pooling their available work could operate schemes giving injured men within their group suitable work as a therapeutic factor. Work should not be used as a weapon against a man in minimizing his "compensation."

Thus would be avoided the long dead period between the times when the surgeon makes the man as fit as he can and when the man undertakes work having received some sort of settlement of what he feels is a just claim.

I also suggest that no doctor or surgeon other than those treating him should be in contact with the patient; and panel doctors should be legally excused from signing the "out-of-work" certificate. They have no desire to do so, but are unable to refuse because the patient will leave them for another doctor. It would be simple to tell the patient that they were not allowed to sign it.

I further recommend that patients who have been off work for more than nine months should have their disability estimated by three surgeons: one on their own behalf, one on behalf of the employers, and one to hold the balance. The decision of this tribunal should be accepted by both sides without any further discussion, and should be presented to the appropriate legal authority.

It is obvious that further investigation of treatment is necessary. I suggest that surgeons should be invited to join groups, each group setting itself to undertake a particular form of treatment, the lines of which should be rigidly specified. Members of each group would come from different parts of the country. For three years each group would continue on its own lines, change of treatment occurring only if its particular line proved hopeless, and only after consultation with the other groups. At the end of three years the respective results should be analysed and discussed.

THREE SEPARATE CAUSES OF ANTE-PARTUM HAEMORRHAGE OCCURRING SIMULTANEOUSLY*

BY

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(WITH SPECIAL PLATE)

This case is of interest as showing three different causes of ante-partum haemorrhage occurring together.

The patient was aged 40; she was a nine-para, the previous confinements and puerperia having been normal. There was no history of pregnancy toxaemia. She was admitted as an emergency case to the Birmingham Maternity Hospital on April 29, 1936, at the twenty-eighth week of her ninth pregnancy, during which she had been much troubled by vomiting from the end of the third month onwards, as a result of which she had lost a good deal of weight. During the previous four weeks she had noticed gradually increasing swelling of the feet and legs, but there had been no headache or visual disturbance. She had had several slight irregular losses per vaginam, the first of which had occurred at about the sixteenth week. Four hours before admission she had had a very severe painless haemorrhage, the amount being described by the nurse in attendance as half a bucketful.

On admission she was extremely pale and collapsed. The pulse was very poor in volume, the rate being 142 per minute; there was marked oedema of the whole of the body below the level of the umbilicus. The blood pressure was 118/40. The uterus was the size of one of thirty-two weeks—that is to say, a month larger than that estimated from the menstrual dates. It was tense but not tender; the foetal parts could not be felt, nor the foetal heart heard. The urine contained a dense cloud of albumin and large numbers of hyaline and granular casts. The loss on admission was only slight.

She was given one pint of 10 per cent. glucose saline solution, and her condition improved sufficiently to allow of vaginal examination being made under gas and oxygen anaesthesia. The cervix was found to be three fingers dilated; through it a soft and fleshy mass was protruding. Fragments of this were removed, and had the naked-eye appearance of hydatidiform mole. Further violent bleeding occurred, and the cervix and vagina were packed. She was then given a transfusion of one pint of citrated blood, which produced a definite improvement. I thought, however, that her condition was not sufficiently good to stand the further haemorrhage which must inevitably take place during the expulsion of the mole, and decided to treat her as a case of severe concealed accidental haemorrhage—namely, by abdominal hysterectomy without opening the uterus. Her age and parity afforded additional justifications for this line of treatment.

Laparotomy, under gas and oxygen anaesthesia, showed that the uterus was very pale and tense and that both ovaries were enlarged and cystic. There was no free blood in the peritoneal cavity. Total hysterectomy was performed with practically no loss of blood; one pint of normal saline solution was left in the peritoneal cavity. Recovery from the operation was slow owing to her extreme degree of anaemia, the red cell count three days after the operation being only 1,700,000. She was given a second transfusion of half a pint of citrated blood on the fourth day, and from this time improved steadily, leaving hospital three weeks after admission.

I did not open the uterus until three months after its removal, to allow for adequate hardening to take place. When I did so I was surprised to find that a small but apparently normally formed foetus was present; that the placenta, in which vesicular degeneration had taken place, was in a position of a central placenta praevia; and that there had been a considerable amount of concealed bleeding between the membranes and the uterine wall. Sections of the placenta showed the normal appearance of a hydatidiform mole. There was no sign of active proliferation suggesting malignancy. Secretions from the thinned uterine wall, however, showed that there was early penetration of the muscle by the villi, which had not reached the peritoneal coat. The naked-eye appearances of the specimen are shown in the photograph (Special Plate).

Commentary

This case presents unusual features, in addition to the three coincident causes of ante-partum haemorrhage. One of these is the occurrence of a vesicular mole in the later stages of pregnancy; another, the presence of a well-developed foetus in relation to it. It is possible that twin foetuses were originally present, the vesicular degeneration having taken place in the placenta of one only. Finally, the case illustrates the value of hysterectomy in the treatment of severe cases of ante-partum haemorrhage.

* A case reported at a meeting of the Midland Obstetrical Society in December, 1936.

Clinical Memoranda

A Triple Pregnancy with Extra-uterine Twins

(WITH SPECIAL PLATE)

The following case of an ectopic gestation in the pouch of Douglas and external to the generative organs seems to be worthy of record.

CLINICAL NOTES (E. H. R.)

A married woman aged 37 was admitted to hospital on September 7, 1936. She had had two children, the youngest aged 12, but no further pregnancies.

She had always been in good health; her periods had been normal, likewise the pregnancies and parturitions. She had complained of vague pains since January of that year in the lower abdomen, with amenorrhoea since June 26. For the last three weeks she had been vomiting; there had been flooding and labour-like pains in the lower abdomen.

On examination she was found to be blanched, and looked very ill. She was passing a good deal of blood. The temperature was 100° and the pulse 112. There was an irregular mass rising out of the pelvis to the level of two inches above the pubes. On vaginal examination a large and rounded mass was felt in the posterior fornix, which was pressing the uterus up in front of it.

SUBSEQUENT HISTORY

On September 10 she passed two fragments, about one and a half inches in diameter, which proved on microscopical examination to be much degenerated placental masses. Eight days later, her general condition having improved, an examination under general anaesthesia was performed. The uterine cavity was found to be four and a half inches long and displaced to the left of the pelvis.

The abdomen was opened on October 2, and a tumour the size of a croquet ball was found; it filled the right two-

thirds of the pelvis, lying behind and completely adherent to the broad ligament. It was also adherent to the wall of the pelvis. It shelled out until the only connexion was with the ovary, whence it derived its blood supply. It was removed and the ovary sutured; there was no connexion between the tumour and the right tube. The patient made an uneventful recovery.

PATHOLOGICAL REPORT (A. G. S.)

The tumour submitted for examination (see Special Plate) was oval; it measured four inches by three and three-quarter inches, and had a vertical depth of two and a half inches. A foetus, corresponding in size to that of a three-months gestation, was found quite external to the tumour, but attached thereto by the umbilical cord.

On opening the tumour a second foetus of the same size was found. The two were attached to a common placenta. The amnion was clearly defined in the second foetus. The rest of the tumour was firm and fibrous; it contained many haemorrhages, and was laminated. The original scrapings from the third individual showed obvious placental tissue with syncytial cells and vacuolated foci.

COMMENTARY

The interest lies in the presence of an intra-uterine pregnancy which had aborted, as shown by the placenta passed per vaginam, the size of the uterine cavity, and a twin extra-uterine pregnancy attached to and arising from the ovary.

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Colloid Goitre Requiring Tracheotomy

A review of the literature of cases of colloid goitre shows that the onset in these cases of acute tracheal obstruction requiring tracheotomy or thyroidectomy is a rare occurrence. C. A. Joll (1932), in a review of 2,000 cases of thyroid disease, had only three cases of acute respiratory obstruction. Berry states that these cases are supposed to be more common in males than in females, and usually occur between the ages of 12 and 20. Of Joll's three cases two were male and one female, and he stated that partial thyroidectomy was preferable to tracheotomy unless the special König's tracheotomy tube was available. Further cases have been recorded by G. R. Girdlestone (1921), one case; W. Capelle (1935), three cases; D. S. Mitchell and R. R. Struthers (1933), one case of tracheotomy at the age of 2½ months for congenital hypertrophy of the thyroid; P. Guibal (1932), one case.

The cause of the obstruction is suggested by Croty to be due to hypertrophy of the pretracheal muscles, and by Rose (1878) to be due to softening of the tracheal rings. The present case was a boy, aged 13, who was admitted as an emergency with acute tracheal obstruction.

CASE RECORD

The boy had complained of a swelling in the neck for about six months and occasional attacks of bronchitis and asthma. He had been ill for two days before admission with a cough. He lived in Halifax, where drinking-water was supplied direct by the borough. On admission the child was unconscious, and a tracheotomy was performed in the receiving ward. A catheter was passed down the trachea to below the thyroid isthmus. The case was then transferred to the theatre, and the isthmus was divided under local anaesthesia. After the operation the pulse rate was 136 and the temperature 101° F. There was a gradual improvement for the next fourteen days, when the temperature returned to normal and the pulse rate to 86. The boy was very pale, but the blood count was: haemoglobin 100 per cent., red cells 5,630,000; colour index 0.9; leucocytes 8,300. Repeated attempts to leave out the tube failed. A well-marked thyroid tumour was present, the right lobe being larger than the left.

On July 19, 1935, bronchoscopy revealed softening of the tracheal rings from pressure of the enlarged thyroid. There was persistent tachycardia and the child was very pale, but examination of the heart revealed no organic lesion.

On August 1, under avertin, intratracheal ether, and oxygen anaesthesia, four-fifths of the right lobe of the gland were resected. The general condition was not very good, but gradually improved. Repeated attempts to remove the tube still failed, and at night, while asleep, the breathing was very noisy and stertorous. Stridor was present as soon as the tube was removed, and it was thought that the pressure of the thyroid had so softened and deformed the trachea that it collapsed when the tube was removed. General treatment with cod-liver oil, ultra-violet light, and calcium lactate 6 grains three times a day was instituted.

The pathological report showed the specimen to be a colloid goitre, and on September 30 the blood calcium was 11.8 grammes per 100 c.cm. The patient was discharged on October 30 with a rubber tracheotomy tube. He was seen at intervals afterwards, and the general condition became much improved.

On January 2, 1936, the tube came out at home and could not be reinserted, but as the child appeared comfortable without it no attempt was made at replacement. He was brought to hospital and kept under observation for five days, but there was no return of the symptoms.

On examination as an out-patient on November 5, 1936, the general condition was good and the weight 6 st. 7 lb. He could play football and no longer snored at nights. The scar showed a little tendency to keloid formation, and the left lobe of the thyroid, though palpable, was considerably smaller than it had been on discharge from hospital ten months previously.

COMMENTARY

On admission the boy was unconscious and a high tracheotomy was performed and the obstruction relieved by the passage of a piece of gum-elastic catheter. Simple division of the isthmus of the thyroid was not successful in relieving the obstruction; bronchoscopy suggested that this was due to collapse of the tracheal rings, and even partial thyroidectomy at a later date would not allow of immediate removal of the tracheotomy tube. It was apparently necessary for considerable time to elapse before the trachea regained its normal rigidity. In none of the recorded cases of a colloid goitre causing tracheal obstruction was the goitre more than moderately enlarged. This is surprising in view of an article on experimental surgery by E. Walter Workman and G. Gavin Miller (1935), in which they made the interesting observation that a colloid phase of the thyroid could be produced in guinea-pigs by an experimentally induced tracheostenosis. If these observations are applicable to man it is surprising that cases of marked tracheal obstruction are not more common, because a small degree of tracheostenosis should tend to increase the size of the thyroid goitre, thereby initiating a vicious circle.

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Reviews

THE ST. THOMAS'S REPORTS

St. Thomas's Hospital Reports. Second Series, Vol. 1. Edited by O. L. V. S. De Wesselow and C. Max Page. 10s. London: St. Thomas's Hospital. 1936.

In a short introduction to the first volume of a new series of these reports Mr. Max Page points out that St. Thomas's was the first of the English hospitals to bring out a publication of papers, clinical lectures, and case notes, recorded by students or the editor with comments by the responsible member of the staff. The first number of the original series appeared in November, 1835, but publication ceased after 1836 until a second series appeared in 1870. This contained articles by members of the staff and medical school and also introduced statistical tables. This series has appeared regularly since, but latterly has consisted mainly of arid statistical tables. Those responsible for the issue of the Reports have had a growing feeling that the disinterested records of bulk figures in relation to hospital work have nowadays little value; at any rate unless they are associated with instructive observations from organized follow-up departments. It has therefore been decided to discontinue the statistical element, and in its place publish an annual volume which will aim, in a series of original articles, at a reflection of recent work carried out in the hospital. The number before us represents the first attempt to fulfil this scheme.

The contributions to the present volume may be grouped under various headings. Of the didactic articles Professor McSwiney contributes one on present-day views of the constitution and function of the involuntary nervous system, and Dr. A. J. Wrigley another on the physiology of menstruation. Here students of the subject will find a very clear and useful guide to the rather intricate interrelations of pituitary and ovarian hormones; and further, the indications for the use of endocrine therapy in the various upsets and syndromes of disordered menstrual functions are well set out. Among the diagnostic articles Professor Dudgeon points out that perfect specimens of particles of malignant growth may be obtained by a careful technique from the sputum of cases of suspected malignant growth of the lung or respiratory tract. In forty-three cases of malignant growth of lung particles of growth were found in the sputum, and the histological features of the malignant cells were comparable with those of specimens obtained at biopsy or necropsy. In an interesting account of modern methods in the diagnosis of plumbism Mr. Lowndes points out that the occurrence of some amount of lead in the body is the rule rather than the exception, and that care must therefore be exercised in the diagnosis of lead poisoning. In cases of suspected plumbism examination of the blood is more satisfactory than estimation of excreted lead. The blood lead is normally fairly constant and abnormal quantities are easily detected. In his experiences of the Friedman test for pregnancy Dr. Bamforth found it rare for a diagnosis of a positive result to be incorrect. If a negative result is obtained the test should be repeated in a week with a fresh specimen of urine. In no case where the first test was negative and the second test positive has the "positive" been shown to be wrong, and the repetition has prevented a number of false negative results. The Friedman test may also be of considerable value in the differential diagnosis of tumours of the testicle, since a large proportion of cases of teratoma of the testicle give a positive reaction.

The more clinical papers include studies of metastatic brain tumours by Dr. Elkington; diabetic coma by Dr. Card; the treatment of pituitary basophilism by *x* rays and of prostatic obstruction by transurethral resection. A very satisfactory summary of the operative treatment of Ménière's disease is given by Mr. Mill; and two orthopaedic papers on the treatment of adolescent coxa vara and of non-union of the carpal scaphoid are useful. In cases of inoperable carcinoma of the rectum a follow-up of 123 cases showed that colostomy alone in the absence of acute obstruction carried an operative mortality of 17 per cent. and did not materially increase the expectation of life; it should be performed only when strictly indicated, and a proportion of cases can be kept comfortable for a long time by other means. At the other end of life the care of the premature infant is usefully discussed by Dr. Doyne Bell, who emphasizes the need for maintaining from the moment of birth the normal body temperature by artificial means, with the minimum of handling and disturbances, and the superiority of breast milk over other methods of feeding.

A study of a more philosophic nature by Professor De Wesselow and Dr. Griffiths deals with the pathology of diabetes. Earlier work had led to the enunciation of two opposite theories: that in the diabetic state sugar might be produced in the body in excess of its current requirements, or that the tissues might be unable to utilize a normal supply of sugar. The discovery of insulin and of its beneficial action in diabetes led to a swing to the latter theory of causation. There are, however, so-called diabetogenic factors in the pituitary gland which are capable of disturbing the normal regulation of carbohydrate metabolism. In any group of patients attending a diabetic clinic there are cases in which the possible role of the pituitary cannot be ignored—those past middle age and obese, whose glycosuria and hyperglycaemia is accompanied by little ketonuria and appears to affect very little the patients' general well-being or to shorten appreciably their expectation of life even in the absence of strict treatment with diet and insulin. Plasma from these patients is found to produce an early arrest of the fall of blood sugar of rabbits after injection of insulin in a manner closely resembling the results of other workers after injection of extracts of the anterior pituitary gland. No such effect followed injection of the plasma of young diabetic patients and of normal controls. The authors suggest that the explanation of the diversity of symptoms and course of these two groups of diabetic patients may lie in a difference of aetiology.

This volume, then, is interesting and instructive, and will appeal not only to old St. Thomas's men but to other workers in similar fields.

VENEREAL DISEASES

Practical Methods in the Diagnosis and Treatment of Venereal Diseases. By David Lees, D.S.O., M.A., M.B., D.P.H., F.R.C.S.Ed., F.R.C.P.Ed. Third edition, edited and revised by Robert Lees, M.B., F.R.C.P.Ed. (Pp. 608; illustrated. 15s. net.) Edinburgh: E. and S. Livingstone. 1937.

Owing to the death of David Lees the third edition of this work has been edited and revised by Dr. Robert Lees with the help of several contributors. The book has remained about the same size; syphilis of the nervous and cardiovascular systems has been rewritten; the chapter on chancroid, phagedaena, inguinal bubo, etc., is all new material, and that on vulvo-vaginitis has been largely rewritten. Two appendixes have been added: one containing a list of the commoner drugs used in syphilis and the other a list of clinics for the treatment of venereal

disease for reference in hospital and dispensary practice.

Students and general practitioners will find all that they need in this admirable little book, which contains a wealth of information in a comparatively small compass. The names of the authors and their wide experience of the subjects with which they deal are sufficient guarantee of the accuracy of the contents of a book which has been brought up to date. Methods of treatment and diagnosis are constantly changing so that a new edition is to be welcomed, and this one is a marked improvement on its two predecessors. Many of the figures are beautifully produced, but others are not so good, notably those showing gonococci and allied organisms on pp. 326–7. The value of vaccines in suitable cases is stressed, and no doubt rightly; it would seem that the pendulum has of recent years swung too far, for many have almost given up using them. Quite rightly, too, the treatment of syphilis has been brought into line with that recommended by the League of Nations Health Committee; the conclusions of this body carry so much weight that he would be a bold man who questioned them.

Mapharsen and short-wave therapy find no place in this book, except that the former appears in the appendix; it may be that both have a future before them. Errors are few, but primipara (p. 117) is not a plural word, and most of us when taking blood from a vein apply the thumb *distal* and not *proximal* to the point where we intend to puncture it; nor do most cricketers "swing the arm round and round" in throwing a cricket ball (p. 45). Expressions such as "male gonorrhoea" and "internal viscera" are better avoided.

DEFENCE AGAINST AIR ATTACK

The Protection of the Public from Aerial Attack. A Critical Examination of the Recommendations put forward by the Air Raid Precautions Department of the Home Office. By the Cambridge Scientists' Anti-War Group. (Pp. 127. 2s. 6d. net.) London: Victor Gollancz. 1937.

This short volume embodies a critical examination of the recommendations issued by the Air Raid Precautions Department. Members of the Cambridge Scientists' Anti-War Group have made experiments on three points—namely: the extent to which it is possible to make an ordinary room gas-proof, the practicability of the methods recommended for dealing with thermite bombs, and the efficacy of gas masks. The value of the last-mentioned inquiry is made somewhat doubtful by the statement of Dr. H. Dolence Woodruffe, county director of the Oxfordshire branch of the British Red Cross, who, speaking at Oxford last month, stated that the container investigated was only a training pattern, and that the container to be issued at the outbreak of war to civilians as well as troops will be much superior. It seems wisest to leave Oxford and Cambridge to discuss this matter. The Cambridge group has proved that an ordinary wall of brick and plaster has surprisingly little power to check the diffusion of a true gas. On the other hand, it must be remembered that the most deadly "war gases" are not gases but either mists or dusts, and to these a brick-and-plaster wall would probably offer a fairly effective resistance.

We are inclined to doubt whether this book performs any public service. The authors comment on the way in which the air-raid precautions officials stress the danger of panic, and ask why should they fear panic so much? The answer seems fairly obvious. An air attack on a big city is certain to be as nasty a business as anyone can imagine. Professor Lindemann, who speaks with authority on such matters, has suggested lately in the *Morning Post* that the probable casualty list from a single big raid would be 10,000 killed and 40,000 wounded. It is, however, certain that the casualties will be increased tenfold if the population dashes about the streets in mobs under the influence of panic, because even if houses cannot be made gas-proof yet people will be far safer inside a house than outside. On the other hand, it must be admitted that the "eye-wash" in Government publications provides a good deal of excuse for the reactions exhibited in this book. Reading the official publications makes one realize the unchanging nature of official minds, in particular with regard to their leading tenet that the public must never be frightened by being told unpleasant truths.

GROWTH OF MEDICINE SINCE THE MID-SIXTEENTH CENTURY

The Development of Modern Medicine. An Interpretation of the Social and Scientific Factors Involved. By Richard Harrison Shryock. (Pp. 442; illustrated. 18s. net.) Philadelphia: University of Pennsylvania Press; London: H. Milford, Oxford University Press. 1936.

Dr. Shryock is professor of history in the Duke University, and his volume on the development of modern medicine is both complete and well written. He gives chapter and verse in footnotes for each statement, and the book is valuable, therefore, as a work of reference for those who wish to pursue further any special line of investigation. It ranges from the middle of the sixteenth century to the present day. Professor Shryock states that his object has been to portray certain major aspects of medical development against the background of intellectual and social history in general. The earlier portions of the book, therefore, are chiefly philosophical and abstract; the later sections are concrete, and deal with subjects and developments in which many of the present generation have taken an active part.

A handsome tribute is paid to the work of the French physicians at the beginning of the last century, especially to Pierre Louis. He was the prototype of the modern whole-time student of medicine. For seven years he did nothing but work in the wards and in the post-mortem room, and for three years he never wrote a word about his results. A well-deserved tribute, too, is paid to Johannes Müller, who was responsible more than anyone else for the introduction of the modern scientific spirit into German medicine and thence into England, where it inspired such great teachers as Sir James Paget. The story of the public health movement from 1800 to 1880 is well told, more especially of the great epidemics of Asiatic cholera in the middle of the century and of the results upon sanitation both in the United States and in Great Britain. John Snow's work is mentioned, but that of Dr. Th. H. Buckler of Baltimore appears to have escaped notice. The growth of bacteriology from the work of Davaine to the time of the viruses is well described, and there is a thoughtful final section on "Practice in a Changing Society, 1880–1930."

The book is well worthy of serious consideration, and should become a standard work. There are eight full-page illustrations copied from paintings by various artists. In view of future editions it may be noted that, as might be expected from our complicated and difficult system of entry to the medical profession, Professor Shryock is not always quite accurate in his statements about the Royal Colleges and the licensing bodies. He calls Lister "a Scottishman," which he was not, for he was an English Quaker. He fails to point out that Captain Cook owed the success of his voyage round the world less to the lime-juice he made his crew drink than to his remarkable

knowledge of sanitation; for he obtained good water wherever possible, ventilated the lower deck, and made his men change into dry clothes. There are slight misprints on pages 265, 329, and 331. Sir Henry Acland's name is incorrectly spelt on page 232 as well as in the index. Sir James Y. Simpson first used chloroform in 1847, not in 1851 as is implied.

RADIOLOGY OF DUST DISEASES

Röntgenatlas der Staublungenerkrankungen der Ruhrbergleute. By Dr. G. Schulte. (Pp. 141; 153 figures. M.24; geb., M.26.) Leipzig: G. Thieme. 1936.

In the last few years the study of silicosis has assumed great importance not only in clinical work in certain districts, but particularly in connexion with workmen's compensation. The diagnosis of the condition still largely rests on the *x*-ray photograph of the chest, and the tendency of silicosis to favour the development of pulmonary tuberculosis increases the difficulties in the differential diagnosis. The atlas by Schulte will therefore be assured of a hearty welcome. A few pages of succinct notes on the various aspects of dust disease of the lungs are followed by remarkably clear reproductions of chest skiagrams, selected portions of each side being printed in natural size.

The book is divided into three parts. The first consists of photographs of the various degrees of silicosis and silico-tuberculosis. Part II comprises several series of two to three skiagrams of the same patient taken at intervals of a few months to a few years showing the development of silicosis, its increasing severity, or its development into silico-tuberculosis in the same individual. Finally, a few skiagrams are added of conditions which may simulate silicosis. Essential clinical notes are appended to each case, with a brief description of the probable underlying anatomical changes; for these Dr. Husten is responsible. Attention may be drawn to the one oblique skiagram included in this volume, for it disproves a current conception that in the course of silicosis calcification may occur in the hilar glands. The author shows that these mulberry-shaped shadows are really situated in the substance of the lung, and are probably due, he thinks, to silicotic changes around bronchioles and vessels in the region of their branching.

Notes on Books

The *1936 Year Book of General Medicine* (Chicago, The Year Book Publishers; London, H. K. Lewis and Co., 12s. 6d.) is a compact little volume divided into five parts, devoted respectively to: infectious diseases, by George F. Dick; diseases of the chest (except the heart), by Lawrason Brown; diseases of the blood and blood-forming organs and diseases of the kidney, by George R. Minot and William B. Castle; diseases of the heart and blood vessels, by William D. Stroud; and diseases of the digestive system and of metabolism, by George B. Easterman. In addition to a review of the recent work on the diseases usually sent to isolation hospitals, the section on infectious diseases contains under the heading of "arthritis" a useful survey of the problem of "rheumatism" and arthritis, including an account of *x*-ray findings in various types of chronic arthritis, results of blood cultures, and the results of fever therapy and other forms of treatment. The section on diseases of the chest, besides a description of the literature on the serum therapy of pneumonia, contains a full account of recent work on tuberculosis both in its medical and surgical aspects. The text is freely interspersed with photographs, skiagrams, and other illustrations.

From the patient's point of view there is not much scope for humour in the profession of dentistry. In *Toothful Essays* (Bale, Sons and Danielsson, 7s. 6d.) Mr. EDWARD SAMSON successfully combats this view. The book is a humorous survey of dental practice, in which the author directs the shafts of a kindly and discerning wit against himself, his colleagues, and his patients. His versatility is remarkable. The essays are admirably illustrated with his own caricatures, and the sequence of prose is occasionally broken by amusing parodies in verse. Mr. Samson divides good patients into two types. The first is almost fanatically attached to his dentist, believes all he says, worships his work, and spares no pains to send everybody else to the door of such a brilliant man. The second demands the very best work and realizes that this deserves the highest award, which he is only too anxious to make without any reminder. On rare occasions these two types coexist to form the ideal patient. Underlying the humour of this book is a substratum of wisdom and shrewd common sense, but it is primarily a book for amusement. Dentists will derive the greatest enjoyment from reading it, but their patients also will find it diverting.

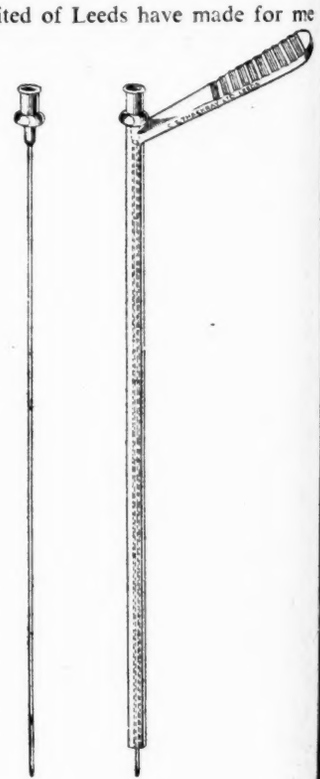
We have received the bound volumes of the Minutes of the General Medical Council and of its various committees and branch councils for 1936, complete with fourteen appendices (vol. lxxiii); also the general index to the minutes of the General Medical Council, the Executive and Dental Executive Committees, and the English, Scottish, and Irish branch councils for 1903–36 (vols. xl to lxxiii). Both volumes are published and sold for the General Medical Council by Constable and Co., Ltd., 10, Orange Street, Leicester Square, W.C., and the prices are 12s. and 10s. respectively.

Preparations and Appliances

SYRINGE FOR SPLANCHNIC ANAESTHESIA

Mr. HAROLD UPCOTT (Hull) writes:

Messrs. C. F. Thackray Limited of Leeds have made for me an instrument to facilitate the production of splanchnic anaesthesia in operations on the upper abdomen under local infiltration. It consists of a blunt-ended rigid cannula six and a quarter inches long, fitted with a flange at one end. This carries a Record needle a quarter of an inch longer than the cannula. When the abdomen is opened a finger of the left hand is passed down to the lateral aspect of the body of the twelfth dorsal vertebra. The cannula, with the needle retracted, is passed along the finger until its blunt end is resting on the posterior abdominal wall. It is held in this position while a syringe is attached to the other end of the needle and pushed home before making the injection. The injection is then repeated on the opposite side.



MEDICAL RESEARCH COUNCIL

ANNUAL REPORT FOR 1935-6

The work of the Medical Research Council as set out in its latest annual report[1] is the subject of a leading article elsewhere in this issue. Below we give some account of the detailed researches. Much of the work has been incidentally referred to in these pages in the course of the year.

Virus Diseases: Transmissible Tumours

The investigations on influenza carried out at the National Institute for Medical Research have made substantial progress. Evidence has been received from different countries as to the world-wide diffusion of the virus originally discovered at the National Institute. Patients suffering from an epidemic infectious fever diagnosed as typical influenza have been reported from parts of the world as distant as Alaska and Australia, Holland and European Russia, and it has been shown in all these cases that the inoculation of ferrets with filtered nasal washings from the patients causes the appearance of the same virus in the respiratory passages of these animals; these ferrets will then infect others. Such evidence has strengthened the probability that the virus thus propagated in the ferret is the primary infective virus of epidemic influenza in man.

One of the accidents that do occasionally occur in the best regulated laboratory has proved fruitful in establishing the identity of the experimental disease in ferrets with human influenza. Virus originally obtained from a human case and afterwards passed through 196 ferrets in series was used to infect another small batch of ferrets, and one of these, when heavily infected, sneezed violently at close range while being examined. Within forty-eight hours the investigator experienced the abrupt onset of a sharp and typical attack of influenza. This experience, carefully investigated, furnished an important link completing the chain of evidence for the identity of the virus, maintained for over two years in ferrets, as the cause of influenza in human beings.

Material obtained from human patients has been used to test the possible association with scarlet fever, measles, and rheumatic fever of viruses transmissible to lower animals. The only positive result yet obtained has been the production in one chimpanzee of a biphasic wave of fever with coryza, following inoculation with blood from a case of measles; no rash or Koplik spots were produced, and a second chimpanzee housed with the first showed no symptoms. Such experiences give small encouragement for further attempts, but, as in influenza, the whole prospect of success in investigating a virus disease is so transformed by its transmission to a species on which deliberate experiment can be made that further trials must be undertaken in the case of human diseases in which a virus is suspected as the infective cause.

G. H. Eagles, studying the bacteriology of rheumatic fever and rheumatoid arthritis, with special reference to the likelihood of these diseases being caused by filter-passing viruses, acting either alone or in association with streptococci, has confirmed and extended the work of Schlesinger and others that virus-like bodies are present in rheumatic exudates and that suspensions of these are specifically agglutinated by the serum of patients with acute rheumatic infections but not by that of healthy persons or persons with non-rheumatic diseases. The aetiological role of the virus bodies is being further explored. Mention is also made of an inquiry by M. H. Gordon into the aetiology of lymphadenoma, with special reference to the significance of the minute "virus bodies" which he found characteristically to occur in the lymph glands in that disease. There is some evidence that these bodies may be the actual cause of lymphadenoma.

Some further work on transmissible tumours is brought forward from the National Institute. Success is recorded in transmitting a tar sarcoma of fowls by injecting a suspension of its cells into pheasants. In all the pheasants some growth occurred, and in two it continued and led to the production of very large tumours. It is considered difficult to explain the results save on the assumption that a virus-like agent is concerned in the production of a bird sarcoma even when the immediate provocation is a chemical stimulus and when no virus can be separated in cell-free suspension from the tumour so produced.

Microscopical Investigation

We noted last year the introduction by J. E. Barnard and his co-workers of important advances in the use of ultra-violet radiations for obtaining photographic images below the range of resolution by light of visible wave-lengths, particularly of the units of viruses. The new optical facilities are affording valuable results. They have enabled a combined use to be made of the original ultra-microscopical equipment for photographing the images obtained by ultra-violet darkground illumination and of the new equipment in which photographs are obtained of the same field illuminated by transmitted rays of the shorter wave-length. The object under study can be transferred from the one microscope to the other without disturbing the adjustment, and the images obtained by the new method are comparable with those yielded by the ordinary visual microscope. The virus units in the natural living condition are opaque enough to the short rays to give satisfactory images on the plate, and the photographs so obtained can now be used as a direct check on the significance of the results by the earlier method of darkground illumination with a longer wave-length.

The use of a shorter wave-length as transmitted radiation has made possible the approach to a new range of virus problems. The units of at least some viruses appear to be far more opaque to ultra-violet rays of the wave-length now accessible than most constituents of the normal cells and body fluids of the higher animals, indicating that the substance of the virus units must be of relatively high density. It is now possible to obtain photographs of virus units not only without fixing or staining but in their living relation to the cell protoplasm in which they occur or to extracellular fluids in which they have been shed. These facilities have made possible a further study of the phases of vesicular stomatitis and foot-and-mouth disease. The way may be pointed to a solution of some of the outstanding theoretical difficulties presented by the more finely particulate viruses.

Endocrinology

A large amount of work is recorded by different investigators in this rapidly developing and changing field. Reference was made last year to the anomalous occurrence and actions of certain hormones, the sexual and other endocrine glands of an animal of one sex producing to some extent the hormone characteristic of the other. More recent observations show that one and the same chemical substance may produce in the different sexes hormonal effects characteristic of both. A. S. Parkes and his colleagues have found in confirmation of Butenandt that substances which may be regarded as simple modifications of the natural male hormone and which produced the effects of that hormone in the castrated male have an oestrogenic effect when injected into the female, and that a small further chemical modification confers on such substances a progestational action.

For the purposes of investigations which were being made for the Therapeutic Trials Committee of the Council it became important to consider the methods available for the assay of sex hormones in human body fluids and

[1] Cmd. 5378. H.M. Stationery Office. (3s.)

excretions. These methods were found to vary greatly, and a comparative survey has been undertaken by R. K. Callow at the National Institute of the results obtainable by the different methods of chemically liberating and extracting each hormone from the different fluids. Some work—as yet negative in result—has also been done following on the discovery by Collip of Montreal that an animal can be immunized against the action of certain hormones of the anterior pituitary lobe by repeated injections of extracts containing excessive amounts of the hormone in question. The point arises whether an animal can produce the antibody in response to an excess of its own hormone. Experiments so far made by Parkes and his colleagues have not succeeded in eliciting whether an animal can in fact be immunized against an extract of pituitary material of its own species containing the hormone in as natural a condition as possible.

Standardization

The National Institute maintains the regular distribution of the biological standards which it holds under the Therapeutic Substances Act or on behalf of the Health Organization of the League of Nations, or for the purposes of the *British Pharmacopoeia*. The Institute has now accepted responsibility for the standards for neoarsphenamine (neosalvarsan) and sulpharsphenamine. Both these standards have been submitted for trials to the control laboratories of several countries, and, their suitability to serve as international standards having been confirmed, they have been distributed to all countries making arrangements for their official application. The new standard preparation of insulin described in last year's report has been distributed to various countries in the Eastern Hemisphere; the distribution in North and South America is made by the Insulin Committee of Toronto.

The national collection of type cultures of micro-organisms continues to be accommodated at the Lister Institute. The number of cultures of bacteria and fungi distributed during the year under review to workers at home and abroad again exceeded 5,000, and some 200 new types were deposited for maintenance.

The Standards Laboratory in the School of Pathology at Oxford maintains the work of producing and standardizing bacterial suspensions and serums for the diagnosis of enteric, dysenteric, Brucella, and meningococcal infections. Suspensions and antiserum of *Bact. dysenteriae* (Newcastle) and of the porcine type of *Br. abortus* have been maintained for supplying to research workers, and the former will probably soon be added to the official list of products available for issue.

Cell and Tissue Growth : Malignant Disease

The report embodies the work on cell and tissue growth carried out at the Strangeways Research Laboratory, Cambridge. C. H. Waddington has extended his studies of the development and differentiation of the primitive tissues of the embryonic chick; he has also proved that the mammalian embryo contains an "organization centre" by showing that suitable fragments of embryonic rabbit can induce the growth of nerve tissue when grafted into the early chick embryo. By irradiating tadpoles Glücksmann and Spear have confirmed their observations, made first on mammalian tissues, that cellular degeneration after exposure to radium or *x* rays is preceded by an interference with mitosis and a reduction in cell division. It was found also that the degree of cellular degeneration produced in tadpoles by a given dose of gamma rays was related to the intake of food, being greater after feeding than after starvation, and this work is being extended.

At the Royal Cancer Hospital, London, experiments are being made on the synthesis of compounds likely to have the physiological activity of the female hormone oestrone. A. Cohen has prepared a series of transformation products of colchicine, the alkaloid present in autumn crocus, which is known to inhibit cell division and has been stated to arrest the growth of malignant tumours. Many of the colchicine derivatives have a similar effect on cell division, and experiments in this field are being continued with the object of finding a substance less toxic than colchicine which might have application in the treatment of cancer.

Some further work has been done at the National Institute on the continuous exposure of mice to dust from tarred roads, with resulting production of skin cancer and an increase in the number and sites of adenomata in the lungs. A control experiment in which the dust was previously freed from tar by prolonged extraction has shown that the warty growths and cancers of the skin are no longer produced, and that there is no such excess of primary lung tumours as were forthcoming with the tar-containing dust. It should be noted that no practicable way of extraction would render the dust absolutely free from traces of tar constituents adsorbed on its particles. In view of the importance of the question whether the dust from tarred roads plays any part in the apparently growing incidence of pulmonary tumours in men these experiments are now being extended to rabbits and guinea-pigs, the skins of which do not show the same susceptibility to contact with the tar dust as do those of mice.

The remainder of the report, including the work undertaken at the clinical research units which are in part staffed and supported by the Council at three London hospitals, and also the many external research schemes in which grantees of the Council are working, will be mentioned in a later article.

Dr. Guns (*Scalpel*, Liége, December 26, 1936, p. 2537) is of the opinion that the treatment of an acute cerebral abscess by puncture pending the formation of a capsule which can be enucleated is not ideal, and points out the high mortality following this method of treatment. Two personal cases are fully described, one acute and the other a chronic abscess of the brain. The first case occurred in a child of 6 years, who had suffered from otitis media and otorrhoea. When seen the child had retro-auricular pain on the left side and violent headache. Hot dressings were placed behind the ear and instillations of oxygenated air and mercurochrome were given. A few days later she became comatose, the left ear was full of pus, and the mastoid region was tender on pressure. The brain was explored and 10 c.cm. of pus containing anaerobes was withdrawn. Decompression was then carried out. The child remained gravely ill, and daily lumbar puncture was necessary. On the fifth day coma set in again, and it was decided to drain the cavity. After a stormy period with cerebral vomiting and meningeal signs the child gradually improved, and the drain was replaced by a dressing. A fortnight after the first lumbar puncture the patient was completely cured. In the second case a man of 57 was suffering from otorrhoea in the right side with retromastoid pain. At operation it was seen that there was extensive necrosis of the whole mastoid area and pus was evacuated from an extradural abscess and from the temporo-sphenoidal lobe. About 30 c.cm. of pus came from the cavity, which was drained. The drain was removed on the fifth day, the meninges were incised, and a gauze drain with iodoform was left in the cavity. This continued to drain for six weeks, by which time the patient had completely recovered. A third case is described, in which the patient made a similarly good recovery. It is considered that drainage of a cerebral abscess should be the procedure of choice, and that enucleation of the abscess should only be carried out in exceptional cases. The value of a large decompression is also emphasized and of injection of sterile air into the abscess cavity.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY MARCH 20 1937

THE UNITED RESEARCH "FRONT"

The layman, perhaps, is apt to think of the Medical Research Council as a body or congregation of bodies working in a laboratory on Mount Olympus, far removed from the toils and sufferings of ordinary medical practice. The researches it fosters are thought to be such as may at some future time prove useful in the healing or prevention of disease, but for the present have an academic interest only. A perusal of the report of the Council for 1935–6—a very readable document,[1] especially its comprehensive introduction—on the contrary reveals a body which is all the time concerned with clinical medicine, correlating at every point the work of the laboratory with attendance at the sick-bed. The outstanding matters discussed this year are such subjects as influenza, nutrition, the prevention and treatment of childbed fever, and the lessening of the ravages of epidemic diseases, all of which are the everyday preoccupations of the general practitioner.

The report this year sounds a special note of triumph, for the most noteworthy event so far as medical research is concerned is the Nuffield benefaction to Oxford, and the way that gift is to be used is exactly in line with what the Council has always preached, though it has not been able to summon millionaires to Old Queen Street, Westminster. It has continually urged the establishment of senior clinical posts on a whole-time or nearly whole-time basis. Three years ago it reiterated its strong belief in the primary necessity of establishing a greater number of senior appointments for whole-time work in research and higher teaching such as would offer the possibility of a satisfactory career in later life to young men who wish to devote themselves to the scientific study of clinical problems. Research in clinical medicine and surgery is greatly handicapped by the fact that careers in these subjects depend too closely upon success in private professional practice. Clinical science has offered no prospect of a career comparable with what is afforded in the laboratory branches of medicine by the existence of numerous whole-time academic and research posts. The result has been that the promising clinical investigator has become increasingly absorbed by the claims of Harley Street. It has been with him as with good Edmund, to change one word of Goldsmith's lines:

> "Who, born for the universe, narrowed his mind,
> And to practice gave up what was meant for mankind."

It has been the declared policy of the Council to establish as opportunity offers and resources permit positions in its own service for whole-time clinical research. The Nuffield gift has now not only endowed Oxford in this respect, but has set an example which it is hoped will be followed elsewhere. Another aspect of the problem to which the Council has been giving attention during the past year is the training of young clinicians with a view to academic and research appointments. To this end it has instituted a series of post-graduate studentships and research fellowships in clinical science and experimental pathology—six of the former and four of the latter—the object being to encourage young medical graduates of special ability and original mind to become investigators in those branches of medical science which are concerned directly with disease in human beings.

The Medical Research Council interests itself also in those problems which, partly medical, have an important social bearing as well. The public interest in nutrition and the determination of the Government to improve the physical fitness of the nation (to which proper nutrition is a necessary corollary) are reflected in the present report. Here again the Council can regard its earlier action with some satisfaction. For some years it has assisted in special inquiries into the amount and type of food eaten by representative communities of people in Great Britain. One interesting point brought out by these reports is the relative consistency in widely separated communities of the proportions of protein, fat, and carbohydrate in the food, although the foodstuffs which are popular vary much in the different places. The instinct of the housewife or some more mysterious factor seems to adjust the balance whatever the local custom or fancy may be. In St. Andrews, Cardiff, and Reading, for example, taking in each place the diet of a number of families, the proportion of protein was found to vary as between one town and another by less than 1 per cent. These figures are the more interesting because of the different type of foodstuffs favoured by different communities. Why is the homely sausage only half as popular in Cardiff as it is in St. Andrews? Why is butter eaten almost universally in Cardiff and substituted very largely by margarine in Glasgow? And it is also permissible to ask from these figures whether Scotland stands where she did, for whereas in 1911 nearly

[1] Report of the Medical Research Council for the Year 1935–6. Cmd. 5378. H.M. Stationery Office. 1937. (3s. net.)

100 per cent. of the Glasgow families investigated ate oatmeal in 1933 not much more than half of them did so. The year has seen the completion of a striking piece of work on the subject of nutrition, with the issue of the final report on the investigation, occupying seven years, directed by the Council's Committee on Dental Disease, in particular on the influence of diet on the decay of children's teeth. The results of the later work support convincingly the earlier findings as to the essential part played by particular qualities of the diet in the proper development and maintained health of the teeth and jaws. Though many aspects of this important problem still remain to be solved, it is considered that this report of the Committee on Dental Disease marks the end of a round in the fight of modern research against dental caries. The implied congratulations to Mrs. Mellanby on the successful conclusion of the work which she began several years ago must have given special satisfaction to the secretary of the Medical Research Council.

Finally—though only finally so far as this cursory review is concerned, for a vast amount of other work has been done or encouraged—there may be mentioned another problem, which is both medical and social, to the elucidation of which the work of the Council has contributed—namely, that of maternal mortality and morbidity. Reference is made to the work on the German dye red prontosil, which has been carried out at Queen Charlotte's Hospital. More clinical and laboratory tests are necessary before an accurate appraisement of the situation can be made, and another reason for delaying judgement is that present experiments promise even better results with the colourless substance para-aminobenzene sulphonamide, which is allied in composition to red prontosil and is in fact its chemical parent. A favourable report of the results of giving this substance to patients with puerperal sepsis was published by Foulis and Barr in the *Journal* of February 27, and clinical tests are also being made at Queen Charlotte's. On the whole problem of puerperal sepsis modern research has transformed the outlook both for its elimination and for its treatment. While the problem on the one side is being tackled by the institution of ante-natal clinics and improved midwifery services, it remains for medical research to discover wherein lie the dangers of infectivity in childbirth and how these can be avoided and treated. By what means can childbirth on the basis of recent research be made secure from sepsis?

"It is quite certain that we ought not to rely, in the first place, on curative drugs. Clearly the ideal to be aimed at in any disease is to prevent its development and thereby make any alleviating remedy unnecessary. This is especially true as regards disease associated with the natural process of childbirth. Modern investigation suggests two lines of prevention. First, childbirth should be so conducted that access of pathogenic organisms to the birth canal of women must be rigorously excluded, especially streptococci associated with sore throat, whether in the respiratory tracts of medical attendants, or of friends, or of the patients themselves. Secondly, the diet of pregnant women should be of such a nature as to raise the resistance to infection to the highest possible level: this means an ample consumption of milk, green vegetable, and other protective foods. If for any reason, known or unknown, these first two lines of defence are broken down and puerperal sepsis does develop, then is the time to bring into action the third line of defence—namely, the treatment which evidence suggests is now available."

We begin on another page some more detailed account of work covered by the report. How voluminous it is may be indicated by the list of twenty investigation committees for special subjects, ranging from anaesthetics to mental disorder, from statistics to bed-bug infestation, from tropical medicine to human genetics. The report itself should be read. Much of it is necessarily formal and prosaic, but it requires little imagination to see that it becomes a collection of dispatches from a part of the front where the fight against disease is being very effectively waged.

THE BIRCHING OF CHILDREN

A recent letter in the Press, signed by medical men and psychologists, drew attention to a report that "at the Aldershot Juvenile Court on February 8 three boys, aged 10, 11, and 12, were ordered to receive six strokes of the birch each." The letter went on "to protest against the imposition of such punishment, which is not only inhuman but reveals the court's ignorance of the scientific treatment of delinquency." With this protest medical men will be in general agreement. It is therefore of some interest to examine the attitude of the public to this question as revealed in legislative enactments. The Children and Young Persons Act, 1932, was the culmination of a movement which began with the Probation Act, 1907, and which has introduced an entirely new spirit of humanity and reason into the administration of law. Among other innovations it set up juvenile courts, in which the young offender meets the magistrates in kindly and informal surroundings, more like those of a family council than of a criminal court. Provision is also made for full investigation of the mental make-up of the delinquent. The whole stress is on turning him from the paths of crime into useful citizenship, on showing him that it is far more attractive and satisfactory to do lawful than unlawful things. When the Government draftsmen were overhauling the Summary Jurisdiction Act, 1879, to decide

which parts of it dealing with children and young persons ought to be repealed, they thought it logical and in keeping with the whole scheme to reject the provision under which a magistrate's court could sentence a child to six strokes of the birch, and the companion provision by which a court could award twelve strokes for more serious offences. As the Government spokesman pointed out in introducing the Bill, judicial birching was dropped because the magistrates' courts had almost ceased to inflict it, and the Government felt that it had fallen into general disfavour and was a thing of the past. When the Bill came before the Lords, however, they inserted an amendment in committee which proposed to re-enact, word for word, the old section, which provided for six strokes of the birch. Peer after peer expressed strong disapproval of the Government's action in repealing the section, and so indispensable did their lordships consider the judicial birching of children that they defeated the Government by 65 votes to 22. The Commons rejected the amendment unanimously, but the Lords insisted on retaining it. Birching therefore remains, and its use is on the increase.

Strong language has been used against judicial birching, in Parliament and outside. The case against it is that it can have no good effect and that it is bound to cause a mental injury that will result either in neurosis or criminality. The whole procedure imposes an intolerable strain. First, the child—who, under the new Act, may be only just 8 years old—may have to wait several days for the hearing; secondly, the solemn and impersonal sentence is in itself harmful; thirdly, the circumstances of the punishment are terrible and inhuman. The child is taken into a bare gloomy room, his clothes are removed, and he is tied up hand and foot to a tripod after the police surgeon has examined him to see that his heart will stand the whipping. A police constable wields the birch—a heavy bundle of twigs that has been soaked in brine—and after each stroke the doctor again examines the child. He makes a final examination after the child is released and administers any necessary treatment. The child is not usually fit to attend school for two or three days. The Earl of Listowel, who raised the subject in the House of Lords in 1933 (Official Report, July 25, vol. 88, col. 1083), quoted anonymous Harley Street specialists as authority for saying that no child in England can stand six strokes of the birch rod as judicially administered without becoming a nervous wreck for months, perhaps years, or a hopeless criminal degenerate. The view in favour of retaining the punishment rests on the assumption that there is a certain small class of children who commit acts of great cruelty or wantonly endanger the lives of others and who will respond to nothing but birching as judicially administered. Some of the Lords who spoke in favour of retaining the birch (Official Report, 1932, May 26, vol. 84, col. 450) said that the Departmental Committee on the Treatment of Young Offenders, which reported in 1927, had recommended the retention of whipping almost unanimously, and Viscount Snowden, for the Government, confirmed that only three members had been against it. Viscount Bertie of Thame, who moved the amendment to insert the rejected words of the 1879 Act, gave an instance of the kind of offender for whom the birch was indispensable: five boys who killed and maimed a number of sheep with iron bars. He said that the police constable was the natural monitor of the working-class child, who expected, if he were caught, to be beaten by the policeman. The Earl of Glasgow pointed out that whereas the Dominions would reject a young immigrant who had been imprisoned they did not mind one who had been birched. Lord Danesfort deplored the "humanitarian and ultra-sentimental" view, and suggested, half humorously, that the Government in abolishing whipping were running in the face of Holy Writ and ignoring the advice of Solomon the Wise. Lord Atkin could not object to a short and sharp punishment of the kind which such children ought to be given in their own homes, and Viscount Exmouth testified that the possibility of a good whipping was an indispensable deterrent to hold in reserve for rare and really bad cases, and that the successful running of an industrial school depended on its existence.

It is probably as difficult for legislators as for other people to think dispassionately in devising punishments to fit crimes. The method by which birching is carried out suggests that vindictiveness as a motive was not absent from the minds of those who in the first place prescribed this barbarous treatment for juvenile delinquency. It is, we suggest, as much an anachronism as hanging for the theft of sheep. A judicial birching, whatever may be the injury to the mind of a growing human being, might well confirm the offender in his potentially criminal ways. The aim should be not to *punish* the delinquent but to discover what social, familial, and personal factors are responsible for his anti-social tendencies, and to institute treatment to correct them. To tie him hand and foot to a tripod and flog him with a brine-soaked birch seems the best way to make a boy of 8 years look upon society as his natural enemy. To condemn such a form of punishment is not sentimentality, and it is to be hoped that the more enlightened attitude of the law to juvenile criminals and delinquents will lead to its abolition.

RENAL RICKETS AND THE PARATHYROID GLANDS

Whereas the association of adolescent or "late" rickets with chronic renal insufficiency has been recognized for many years, the underlying pathology is by no means clearly understood. It was once held that retention of phosphorus, due to the impairment of renal excretion, interfered with calcium metabolism—a theory which was discarded when it was observed that renal rickets might occur without an abnormally high inorganic blood phosphorus. Mitchell then suggested that the excess of phosphorus which could not be excreted by the kidney was excreted into the bowel and there combined with the calcium of the diet to form insoluble calcium phosphate. The rickets was thus to be regarded as the result of calcium deficiency, and this view was supported by Salvesen's observation that administration of calcium lactate in large amount improved both the clinical and biochemical state of a patient with renal rickets and uraemic symptoms, although it provided no permanent cure. Recently enlargement of the parathyroids has been noted in several cases of renal rickets, and has given rise to an endocrine as opposed to a primarily renal theory of origin. Chown has even gone so far as to suggest that both renal and bone lesions, and the lack of growth, are the outcome of a pituitary lesion, though there is little to support this contention. Dr. N. L. Price and Professor T. B. Davie[1] give a detailed clinical and pathological report of a case, that of a boy of 14, in which enlargement of the parathyroid glands was associated with renal rickets of the osteoporotic type and calcinosis of the kidneys. They draw attention to the two radiological types of renal rickets described in the literature—namely, that in which there are florid rachitic changes at the ends of the long bones, and that in which there is general osteoporosis, with loss of distinction between the cortex and medulla, and in which the cupped metaphysis shows a ground-glass, woolly, or moth-eaten appearance with varying degrees of stippling. They claim that this latter type is to be correlated with overactivity of the parathyroid glands, and emphasize the importance of calcuria and the presence of foci of interstitial or even intratubular calcification in such cases. In their view renal rickets should be looked upon as "the common ground of overlap" of hyperparathyroidism on the one hand and of chronic renal damage on the other. At the one extreme are those cases with enlargement of the parathyroid glands and possibly some pituitary dysfunction in addition—the "endocrine" group—and at the other are those in which congenital abnormalities of the renal tract are associated with renal insufficiency. A further study of the relation of renal insufficiency to the parathyroids has been carried out by Pappenheimer,[2] who with Wilens had previously produced evidence that in chronic nephritis enlargement of the parathyroids was constant and proportional to the renal damage. Pappenheimer has now studied the effect of experimental reduction of kidney substance on the parathyroid glands and skeletal tissue. Using healthy white rats weighing from 150 to 250 grammes he removed one kidney by the lumbar route and destroyed a considerable part of the opposite kidney by thermocautery. Unoperated litter mates were used as controls and all the animals were kept on a mixed diet. They were killed after a variable time, and the volume of the parathyroids was determined. A decided increase in parathyroid tissue was demonstrated in the operated animals as compared with the controls. Measurement of the nuclei of the cells suggested that the increase could be accounted for, in part at least, by an increase in the size of the cells. Mitotic figures were rarely discovered. Changes simulating an advanced stage of glomerulonephritis were observed in the remaining kidney substance. Further experiments, in which both the nephrectomized and control animals were kept on a low calcium diet, showed that whereas the low calcium diet resulted in some parathyroid hyperplasia in both operated and control animals the hyperplasia was much more marked in the former. The partially nephrectomized animals were stunted in growth, and the histological changes of florid rickets were found in the bones. Pappenheimer considers the results obtained to be comparable to renal rickets in man. He points out that the crucial experiment, yet to be performed, will be to study the effect of experimental renal insufficiency in the absence of the parathyroids in order to demonstrate the role of these glands in the production of skeletal changes.

[1] *Brit. J. Surg.*, 1937, **24**, 548.
[2] *J. exp. Med.*, 1936, **64**, 965.

EXPERIMENTAL SILICOSIS

There is so great a variety of dust hazards in industry that we need an experimental method by which the danger of any particular dust can be determined. At one time the exposure of animals for long periods in a dusting-chamber was the only recognized way of performing such an experiment, and its one merit was that of being strictly imitative; the procedure was laborious and the results slow and uncertain. The intratracheal injection of a suspension of the dust, a method introduced by the late Professor E. H. Kettle, was a vast improvement on the dusting-chamber, and combines facility of execution and certainty of effect with the significance which must attach to the production of lesions in the lung itself rather than in other organs. Nevertheless other methods of parenteral injection have been adopted with the same end in view, including even the intravenous route: one of these is intraperitoneal injection in guinea-pigs, advocated in several previous papers by Miller and Sayers, who now publish[1] an amplified series of studies by this method. Dust so injected collects chiefly in the peritoneum of the abdominal wall, and any lesions produced can therefore be readily studied in that situation. Three types of reaction were observed. The "absorptive" reaction consisted in the formation of nodules which afterwards diminished in size, and was elicited by calcite, limestone, gypsum, and Portland cement. In the "proliferative" reaction, caused by pure quartz and other similar mineral dusts, nodules were formed which continued to increase in size for three months

[1] *U.S. Pub. Hlth. Rep.*, 1936, **51**, 1677.

and exhibited the type of cellular reaction seen in the true silicotic nodule. A third and large class of dusts were found to be "inert," their fate being slow dispersion accompanied by little cellular reaction; that coal and talc should be found in this category is according to expectation, but the inclusion in it of asbestos and sericite seems to call for some comment, although the authors themselves make none. Asbestos is certainly not inert in the lung, nor, according to the convictions of many, is sericite. Although this is a convenient method of assay it perhaps remains to be proved that the reaction of the peritoneum to dusts is always of the same nature as that of the lung. Not only are these two tissues different in structure and function, but there is also the difference that in Miller and Sayers's method the experimental field must be bacteriologically sterile, whereas infection may play a considerable part in modifying the silicotic process in the lungs.

CRIMINAL ABORTION IN FRANCE

Criminal abortion is increasing in most countries, but its increase causes particular anxiety in France, where the birth rate is declining. Dr. Paul Balard[1] believes that there are as many criminal abortions in France as births. As he points out, abortion produced by wilful interference is much more dangerous than involuntary abortion, for it is so often accompanied by serious haemorrhage and infection. His own mortality figures are 3.5 per cent. for criminal and 1.25 per cent. for other abortions. The only possible remedy in which he sees any hope is a change in the mentality of the age and the acceptance of a policy of reproduction. Many unmarried women, he remarks, seek abortion because the father of the child refuses to accept any responsibility, and many married women seek it because their husbands blame them for the pregnancy and regard it as a personal injury to themselves. Nowadays, it seems to him, a child is looked upon not only as a responsibility but also as a nuisance and an impediment to a life of pleasure and distraction. He sees in religious morality the only barrier against an individualism which has got out of hand; meanwhile maternity must receive positive encouragement. He would award the father a substantial allowance in respect of every child after the third. If, he argues, fathers of families had more spending power the money would provide employment for others and would be better spent than if it were distributed as a dole. He suggests that the police could easily compile a fairly complete list of all practising abortionists, and could make these practitioners feel that they were being watched and that their calling was too risky to be worth while. The existing law—if the police cared to use it—gives them ample power to prevent the sale of the bougies, cannulae, and drugs which are widely exposed for sale and are designed for nothing but criminal abortion. If no woman were allowed to pursue the double calling of herbalist and midwife many recruits would, he says, be lost to the army of abortionists. He admits that the measures he advocates are drastic, but holds that they are necessary. The paradox remains that France, with its falling birth rate and desperate anxiety for the future size of its population, has a social convention which is more savage in its condemnation of the unmarried mother than that of almost any other country. Moreover, economic conditions in France make marriage difficult for young persons, and the legal and social sanctions which require the consent of the head of the family render it unattractive. Human instincts and emotions have found outlet in a system of liaisons which have been universally tolerated as indispensable. This acceptance of the irregular union comes into urgent conflict with the legal prohibition—the result of anxiety at the falling birth rate—of the sale and use of contraceptives. The inevitable outcome is an epidemic of criminal abortion. France and other nations with the same problem cannot have it both ways. If they want a large population they must encourage motherhood. As it is a social disaster to encourage unmarried motherhood they must make early marriage easy and attractive. The Italians seem to have gone some way towards solving the problem, and the French might perhaps profit by their example.

[1] *Gaz. hebd. Sci. méd.*, 1936, **57**, 802.

HEAT DISEASE

From observations made in the steel mills of Pennsylvania Heilman and Montgomery[1] have recently published a careful clinical and laboratory study of the pathological effects of heat. All their cases appear to have fallen within one or other of the now well-recognized three clinical forms of heat disease—namely, heat cramps, heat exhaustion, and heat hyperpyrexia, to which they have given the name "heat retention." Heat cramps are usually abrupt and dramatic in onset. For example, a furnace gang is working before a huge blazing furnace having a temperature of 1,500° F. The heater throws open the door and turns the pack; he puts down his tongs, falls doubled up, and writhes in agony on the floor. Recurring muscular twitches attended by pain begin. Violent paroxysmal cramps of the muscles and trunk and extremities twist his body; his face is flushed; his pupils are dilated; and his expression is that of excruciating pain and distress. He complains of dizziness, tinnitus, and gastro-intestinal cramps. Vomiting is frequent and spasm of the respiratory muscles may interfere with breathing. Patients with heat exhaustion have symptoms of faintness and collapse without cramps. The picture is that of shock. Patients in the heat-retention group show the pathognomonic manifestation of high temperature. The temperature rises from three to ten degrees. Occasionally the onset is abrupt and the subject may fall unconscious or die with startling suddenness. More usually there are restlessness, occipital headache, vertigo, and great excitement; extreme drunkenness is often simulated. In regard to heat cramps the authors confirm that the essential aetiological factors are dehydration and loss of salt. The importance of replacing salt as well as water is now well recognized.

[1] *J. indust. Hyg.*, 1936, **18**, 651.

A man doing heavy work at a high temperature may lose up to 20 grammes a day. McCance, in his Goulstonian Lectures,[1] emphasized the difficulty of meeting abnormal demands for salt on a normal diet. Heilman and Montgomery advocate the liberal supply to workers of chilled saline water (0.1 to 0.2 per cent.). In developed cases of heat cramps intravenous infusion of saline afforded almost immediate relief. The most interesting finding in cases of heat exhaustion was a depleted blood sugar, which in the authors' patients averaged 64.3 mg. per 100 c.cm., a figure much below that found in their controls or in the other two heat syndromes. Since the routine administration of gum-drops to operatives the cases of heat exhaustion per year fell from 326 to 67. The term "heat retention" appears truly descriptive in that it was found to be prone to occur in men who could not perspire normally. When the external temperature exceeds that of the body loss of heat by radiation and conduction ceases and the regulation of body temperature depends solely upon convection and evaporation. Poor perspirers must shun the Tropics, the steel mill, and the stokehold. Anhidrosis is uncommon and usually congenital, but Mogens Fog[2] has just recorded in detail an interesting case of complete loss of the capacity to sweat in a young man following upon an attack of paratyphoid fever.

VITAMIN C IN MILK

Working at the National Institute of Research in Dairying, Kon and Watson[3] have explained some of the discrepancies in observations on the vitamin C content of milk. Ascorbic acid is known to be an unstable substance readily oxidized to dehydro-ascorbic acid. The oxidation product is not titratable with the indophenol reagent which is used for the estimation of vitamin C, but can readily be reconverted into ascorbic acid by reduction with hydrogen sulphide. Kon and Watson find that ascorbic acid and dehydro-ascorbic acid are equally active biologically. On the other hand dehydro-ascorbic acid is unstable in milk, as in aqueous solution; it is steadily converted into a biologically inert form which cannot be reconverted to ascorbic acid. This process is greatly accelerated in milk by exposure to sunlight or even to bright daylight. After half an hour's exposure to bright daylight in an ordinary pint glass milk bottle practically the whole of the ascorbic acid is oxidized. Part of it is still biologically active, but a large proportion is biologically inert, and the change to the inert form continues steadily, even in the dark. Apparently there are more disadvantages in allowing milk to stand on the doorstep on an early summer Sunday morning than the mere risk of having it stolen. The authors find that if milk is taken direct from the udder, where ascorbic acid is all excreted in the reduced form, and immediately pasteurized there is no loss of activity; but pasteurization even after a brief exposure to light rapidly changes dehydro-ascorbic acid into the inert form. A pint of cow's milk straight from the udder may contain as much as 20 mg. of ascorbic acid, and it is a pity that the greater part of this is being lost. According to van Eeklen[4] and Heinemann[5] an adult requires 60 mg. a day, and it is probable that suboptimal intakes are very common. The destruction of ascorbic acid in milk under the influence of light is, however, so rapid that its preservation would require elaborate and expensive alterations in the methods of distribution. Dairy milk can therefore not be relied upon as a source of vitamin C.

PULMONARY INFARCTS

We have previously referred[6] to the work of Villaret, Justin-Besançon, and Bardin, who, as the result of experiments, concluded that death following pulmonary embolism was due to a reflex phenomenon determined by the impact of fine particles on the nerve endings in the pulmonary arterial bed. L. Justin-Besançon, J. Delarue, and P. Bardin[7] now describe additional experiments in which embolic infarcts were produced, as before, by introducing porcelain "pearls" into the external jugular vein. None of the animals died as a result of this procedure: they were killed by intravenous injection of formalin or chloroform at different intervals up to thirty days after the introduction of the pearls, and the histological changes in the lungs were studied. The authors dismiss the various theories of the formation of pulmonary infarcts: they find that the infarct is not merely a simple interstitial haemorrhage, since definite changes in the lung parenchyma were observed to precede and follow the haemorrhagic infiltration, while others appeared to be independent of it. These changes comprised early oedema, leucocytic diapedesis, macrophagic metamorphosis, and cellular multiplication of the alveolar walls at the same time as the haemorrhagic invasion, and also haemorrhagic infiltration of the walls of vessels in the region of the infarct and bronchial lesions. They conclude that a pulmonary infarct should be regarded as an acute exudative and haemorrhagic inflammation brought about by sudden local disturbance of the neuro-vegetative and vasomotor equilibrium of the lung.

The late Sir Austen Chamberlain was chairman of the Court of Governors of the London School of Hygiene and Tropical Medicine and chairman of the Governing Body of the British Post-Graduate Medical School, and took a deep personal interest in the work of both institutions.

We would again remind members of the British Medical Association of the arrangements made for the visit to Belfast of a liner, the s.s. *Almanzora*, providing accommodation for 450 people attending the Annual Meeting in July next. Particulars will be found in our *Supplement* this week. To ensure that these arrangements are carried into effect bookings should be made without delay.

[1] *Lancet*, 1936, **1**, 643.
[2] *J. Amer. med. Ass*, 1936, **107**, 2040.
[3] *Biochem. J.*, December, 1936, p. 2273.
[4] *Biochem. J.*, December, 1936, p. 2291.
[5] Ibid., p. 2299.
[6] *British Medical Journal*, 1935, **1**, 1180.
[7] *Presse méd.*, 1936, **92**, 1856.

ENDOCRINES IN THEORY AND PRACTICE

This article is one of a series on Endocrinology contributed by invitation

HORMONE DEFICIENCIES IN THE MALE

BY

KENNETH M. WALKER, F.R.C.S.

The Male Hormone

The testicle was the first organ in the body in which the existence of an internal secretion was demonstrated. Bertholdt's transplantation studies in the capon, as long ago as 1849, might indeed be considered the pioneer experiments in endocrinology. In spite of this early start it is only within the last few years that the testicular hormone has actually been isolated. That this should have happened long after other organs of internal secretion have yielded their active principle to the biochemists' methods of extraction is due in great part to the fact that, whereas such glands as the thyroid store large amounts of hormone in concentrated form, the quantity of internal secretion within the testis at any given moment is very small. F. C. Koch has estimated that to obtain one capon dose of testicular hormone anything from 50 to 100 grammes of testicular tissue are required. Yet in human therapy the amount of effect produced by one capon dose is negligible, and it would be necessary in order to produce an effect to measure the amount of secretion given not in capon doses but in milligrammes of pure secretion. When it is realized that according to Koch a whole ton of bull's testicle contains only 100 to 150 milligrammes of pure hormone it will not seem surprising that the therapy of the testis lags woefully behind that of the thyroid.

To Butenandt must be given the credit of first having isolated in pure crystalline form the male sex hormone. This he achieved in 1931, not, as others had attempted, from the testicle itself, but from human urine, obtaining 15 milligrammes of a substance he called androsterone from 25 litres of urine. Eventually sufficient of this pure product was extracted to permit of analysis; it yielded the formula $C_{19}H_{30}O_2$. Later E. Laqueur and his associates succeeded in isolating the hormone from the testis itself (testosterone), and Ruzicka, in preparing what was apparently an identical substance, from cholesterol (androsterone and dehydro-androsterone).

The chemistry of these various products is still debated, as is also the question whether the testis may not form more than one hormone. Moore, writing last year, says that, in spite of the fact that different methods of extraction yield what is apparently the same product, there are reasons for believing that the testis secretes more than one active principle. Should this turn out to be the case it may explain the confusion that has long existed on the subject of the source of the internal secretion of the testis. Of late years Ancel and Bouin's conclusions that the interstitial cells of Leydig were alone responsible for the formation of internal secretion have been widely criticized, many authorities believing that the cells of the seminiferous tubules furnish an internal as well as an external secretion. This subject, although of great interest, is, however, outside the scope of a paper that aims only at giving a general survey of male hormone therapy.

Of the male hormone deficiencies with which medical men may be called upon to deal the commonest are the various deficiencies that are grouped under the heading of eunuchoidism, arrest of the normal descent of the testis (undescended testicle), and failures in spermatogenesis (azoospermia, oligozoospermia, and necrozoospermia). These conditions will now be considered.

Eunuchoidism

From the outset it must be confessed that attempts to treat eunuchoidism either by the administration of hormones or by means of testicular grafts have met with but little success. This is due partly to the fact that in the majority of cases eunuchoidism is not a pure condition but is associated with deficiencies in other members of the endocrine circle, and especially in the pituitary. Its treatment therefore calls for multiple organotherapy and for the administration of active principles which we do not at present possess in sufficient quantity for the purposes of medicine. It is also explained by the practical difficulty of obtaining enough testicular hormone to exert a therapeutic action on the human body. Professor Koch once confided to the writer that with all the abattoirs of Chicago at his disposal he could only obtain enough male hormone for laboratory experiments, and that he saw little hope of sufficient quantities ever being available for human therapeutics. Since this remark was made other sources of male hormone have been discovered, but unfortunately all the methods of extraction are so expensive that many years are likely to pass before testicular hormone therapy becomes practicable. It is probable that when eventually this is the case the source of supply will be from sterol by means of synthetic degradation methods.

In the meantime various commercial preparations, labelled "testicular extract," will be administered by the medical profession to their patients in a spirit of optimism that may sometimes help the patients psychologically and can certainly never harm them. Even when the brand of male hormone selected for injection contains the active principle of the testicle the amount given is so small as to exert no appreciable influence on the body. But as often as not the testicular extract, as well as being inert, is administered orally, by which route at least ten times as much hormone would be required in order to produce an effect.

Undescended Testicle

Of the hormonic treatment of undescended testis it is possible to speak with greater optimism. The experimental work of Evans, Smith, Engel, Aschheim, and many others has shown that a gonad-stimulating principle is present in the anterior lobe of the pituitary, controlling the activities of the ovaries and testis. Other experiments suggest that this principle is twofold: one acting chiefly on the germ cell and the other on the thecal cells of the ovaries and the interstitial cells of the testis. Aschheim and Zondek's subsequent discovery that a gonadotropic hormone similar in action to that produced by the pituitary could be extracted from pregnancy urine has much facilitated work on this subject. By providing a source from which gonadotropic hormone can with less difficulty be obtained they have indeed brought what was previously

an interesting scientific observation within the realms of practical therapy. Engel in 1932 led the way by proving that injections of extracts of anterior pituitary or of pregnancy urine into immature monkeys brought about the descent of the testis into the scrotum by the fourteenth day. Since then a large number of writers have published the results of this treatment in human beings. In a paper appearing in the *Lancet* of last year A. W. Spence and E. F. Scowen recorded the results of treating thirty-three patients suffering from imperfectly descended testis with 500 rat units of pregnyl twice weekly. In eleven out of the nineteen unilateral cases the testis descended, and in six of the bilateral cases both testes reached the scrotum: in four only one did so. E. McLellan later published similar results, and at the same time commented on the type of case that was more likely to respond to hormonic treatment. His conclusions were that hormonic therapy had a better chance where the undescended testicle was small and undeveloped, but that when the testicle approximated to the normal orchidopexy was the treatment of choice.

Treatment of Aspermatogenesis

Laboratory work on the gonadotropic hormone of the anterior pituitary strongly suggests that these consist of two factors: one of these, prolan A, in the female brings about maturation of the Graafian follicle and the production of oestrin; the other, prolan B, converts the follicles into the corpora lutea, inhibits the production of oestrin, and stimulates that of progestin. In the male prolan A acts on the tubules and stimulates spermatogenesis, whilst prolan B works on the interstitial tissue of the testis, causing it to hypertrophy. Pregnancy urine, from which gonadotropic hormone for clinical purposes is usually obtained (pregnyl), contains much larger quantities of prolan B than of prolan A. Consequently the action of pregnyl on the development and descent of the testis is far more marked than any action on its tubules. Indeed it is controversial whether pregnancy urine extracts have any effect on spermatogenesis, and it is quite likely that we may have to wait until sufficient quantities of prolan A can be obtained from animal pituitary glands before we can hope to influence materially cases of aspermatogenesis. This at any rate is the lesson to be derived from experiments in hypophysectomized animals, in the case of which anterior pituitary extracts have proved far more effective than urinary extracts in re-establishing the activity of the tubules. In the meantime we are compelled to treat these cases with the extracts that are at present available. In this connexion it should be remembered that some cases of male sterility are due not to a deficiency of prolan A but of thyroid. These will rapidly respond to the use of small doses of that gland.

Endocrine Therapy in Prostatic Enlargement

Recently attention has been directed once again to the question of the relations of the male hormone to enlargement of the prostate, and attempts are being made to treat this condition by testicular extracts. This therapy is based on the assumption that enlargement is the result of a disturbance in the normal balance existing between the secretions of the testis and those of the pituitary. Niehans, in the endocrinological survey preceding his paper on the treatment of prostatic enlargement by operation Steinach II, has gone so far as to state categorically that enlargement of the prostate is due to a preponderance of the internal secretion of the Leydig's cells over that of the cells of Sertoli, with secondary reactions on the pituitary, and that if the balance between these secretions can be restored the prostate shrinks. On the shifting foundations of as yet unconfirmed experiments he has built up a complicated structure in order to support his practical findings, that ligature operation brings about a shrinkage of the enlarged prostate. Unfortunately our present endocrinological knowledge is so limited that logical arguments for or against Niehans's operation have little value. Not only is the pathology of prostatic enlargement itself a matter of doubt, but the endocrinological foundations on which he builds cannot support the weight he places on them.

The only recent positive finding on the subject of the pathology of prostatic enlargement on which we can put reliance is Lacassagne's observation that if oestrin be injected into mice certain changes occur in the prostate. These changes consist of the conversion of the single layer of cells lining the prostatic tubules into stratified epithelium and distension of the alveoli by masses of keratin. These modifications in the prostate are often followed by retention of urine, hydronephrosis, and suppuration in the contents of the distended prostate. H. Burrows and N. M. Kennaway have noted the same phenomena after applying oestrin to the skin of mice, and Parkes and Zuckerman proved that similar changes may be produced in the prostates of monkeys. Laqueur has thrown further light on the subject by showing that these changes are more likely to occur in the absence of male hormone, being more readily produced in young castrated mice and rats. He has also shown that mice can be protected from the increase in size of the prostate by simultaneous injections of male hormone. He therefore suggests that in prostatic enlargement there exists an improper balance between the male and oestrogenic hormones in the body. Acting on this suggestion, he and a number of other investigators have attempted to treat enlargement in human beings by means of repeated injections of male hormone. Laqueur himself reports favourably on 133 cases so treated, but other workers have obtained less definite results.

At the present moment this matter is being investigated under the auspices of the Medical Research Council. These experiments are still in progress, and it would be rash on the part of one who is engaged in this work to foretell the future. I cannot, however, avoid expressing the opinion that when the results of these experiments are eventually published they will not reveal that any dramatic step forward has been taken in the hormonic treatment of prostatic enlargement.

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—— (1931). *Bericht. gesam. Physiol.*, **61**, Nos. 3 and 4.
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A. J. Ballantyne and I. C. Michaelson (*Brit. J. Ophthal.*, January, 1937, p. 22) record a case of perivasculitis retinae in a man of 30. The clinical and pathological details, aetiology, and diagnosis are carefully discussed, and an analysis of sixty-eight similar cases is given. This condition occurring in young adults is usually confined to the veins, may be shared by the cerebral vessels, and may well be the basis of recurrent vitreous haemorrhages in adolescence (Eales's disease). Though usually stated to be tuberculous, perivasculitis may be associated with thrombo-angiitis obliterans. The case reported appeared to be toxic in origin.

N. MUTCH: MEDICINAL KAOLIN IN FOOD POISONING

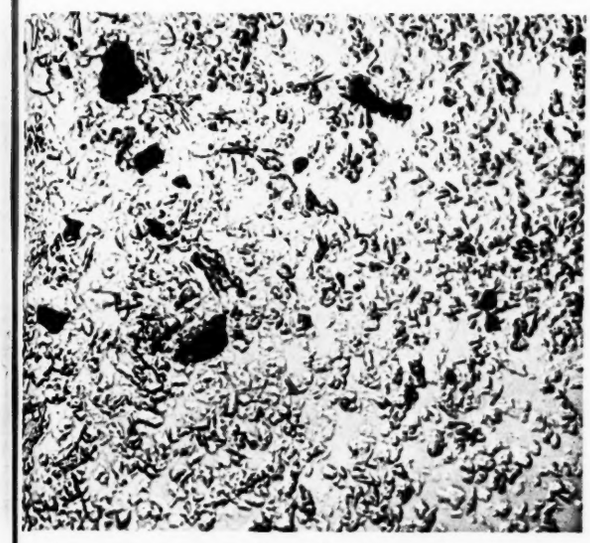


FIG. 1.—Deposit from kaolin, *British Pharmacopœia*. (× 300.)

FIG. 2.—Deposit from purified proprietary kaolin. (× 300.)

J. GORDON HAILWOOD: CARCINOMA OF THE BRONCHUS IN A BOY AGED 19

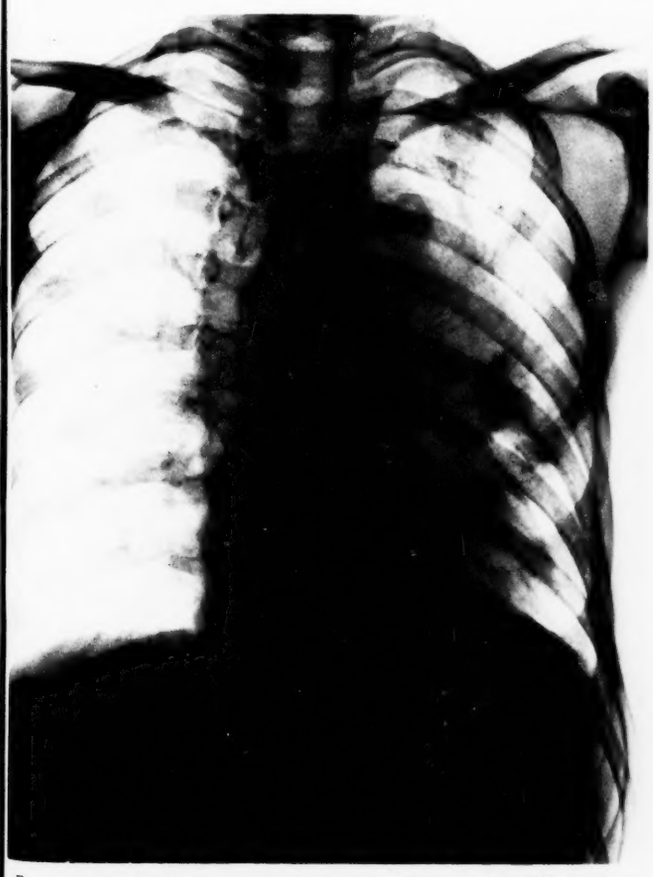


FIG. 1.—*X*-ray showing large mass extending from left root with collapse of lung.

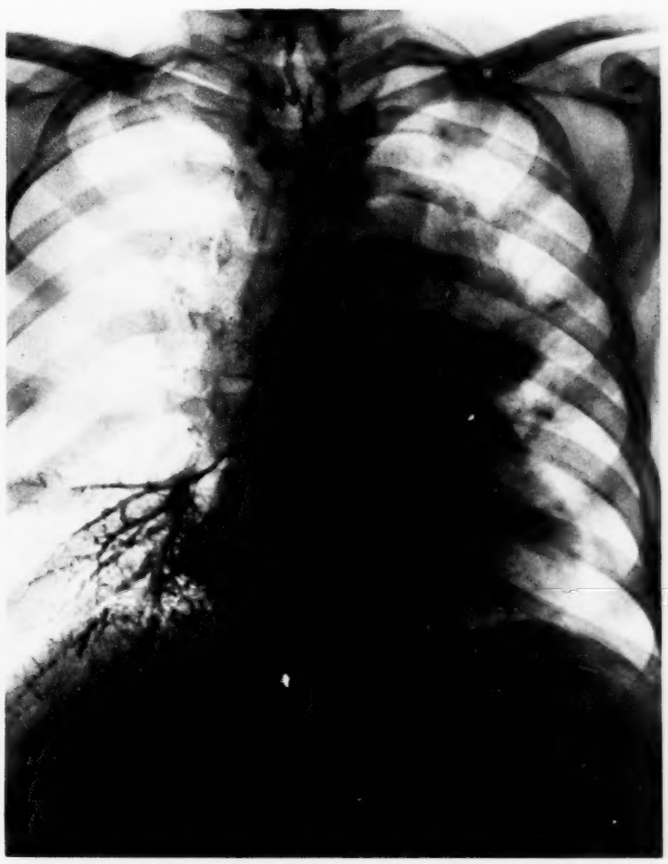


FIG. 2.—*X*-ray following introduction of lipiodol; showing obstruction of left bronchus with typical "rat-tail" deformity.

C. E. H. TURNER: TERMINAL CASEATING TUBERCULOUS BRONCHOPNEUMONIA

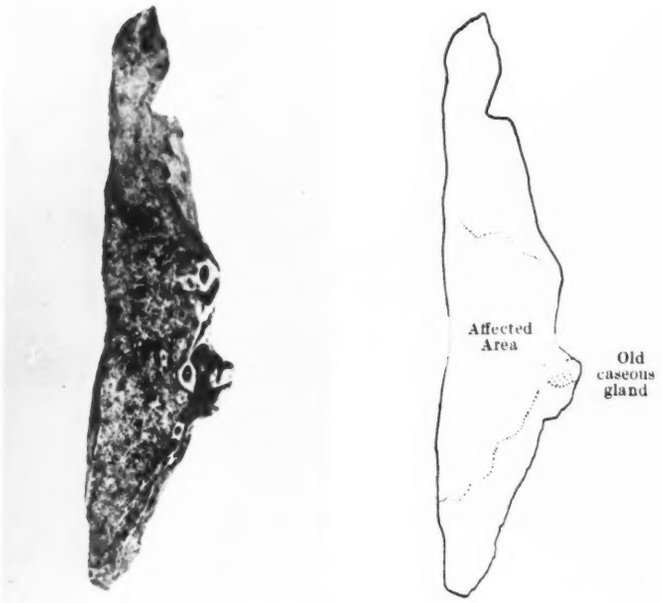


FIG. 1.—Right lung on August 20, 1936

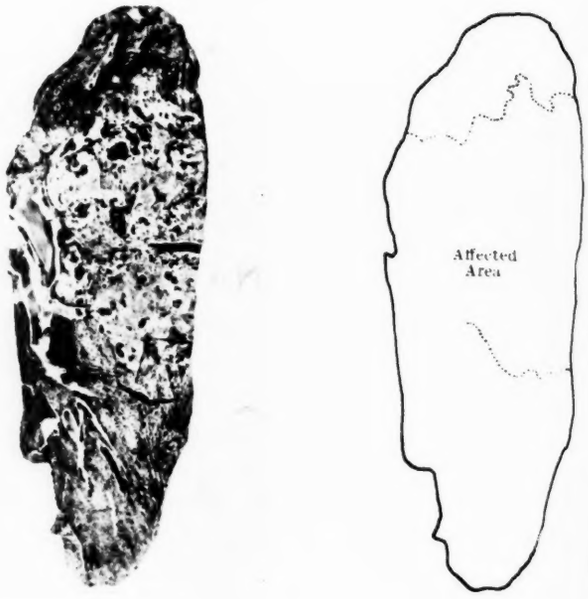


FIG. 2.—Left lung on August 20, 1936

PHILIP J. GANNER: THREE SEPARATE CAUSES OF ANTE-PARTUM HAEMORRHAGE OCCURRING SIMULTANEOUSLY

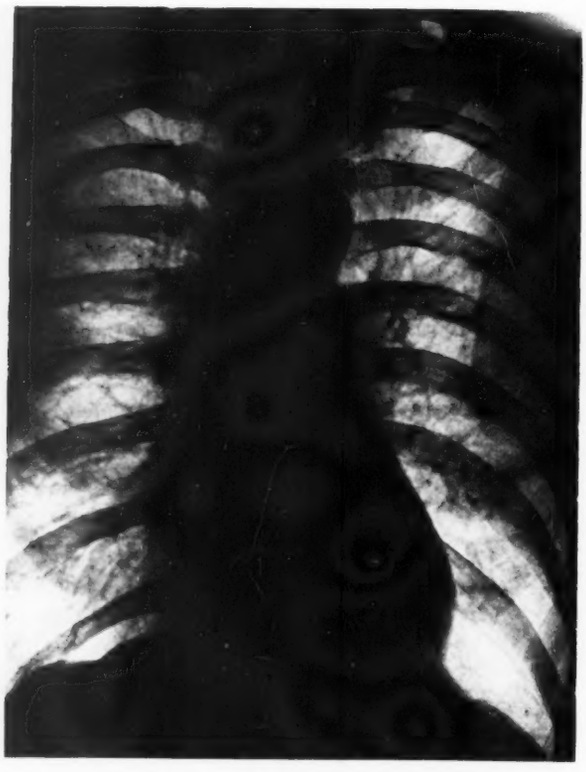
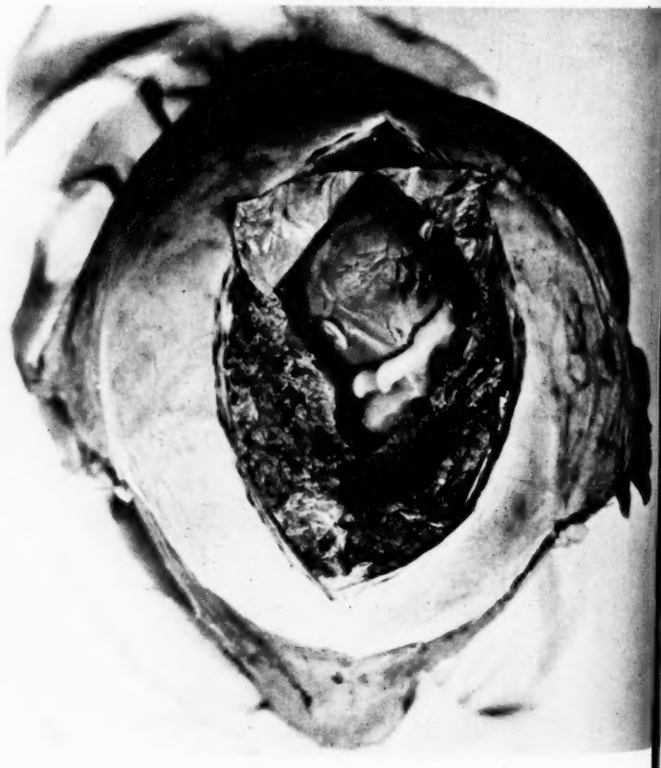


FIG. 3.—*X*-ray of chest taken on July 2, 1936.



Uterus opened three months after removal.

M. C. G. ISRAELS: INFECTIOUS MONONUCLEOSIS AND MONOCYTIC LEUKAEMIA

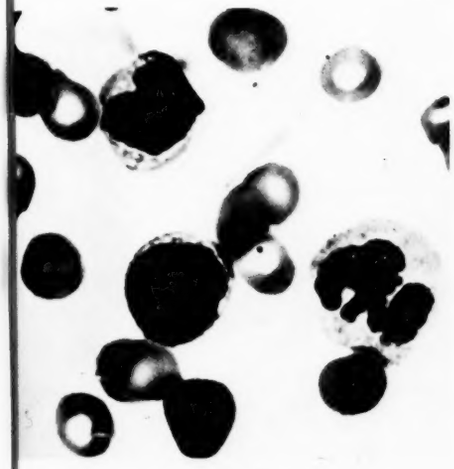


FIG. 1.

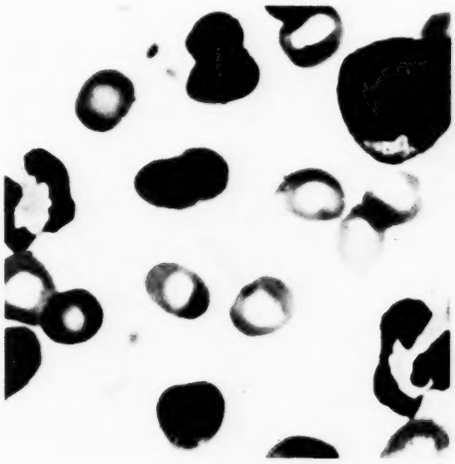


FIG. 2.

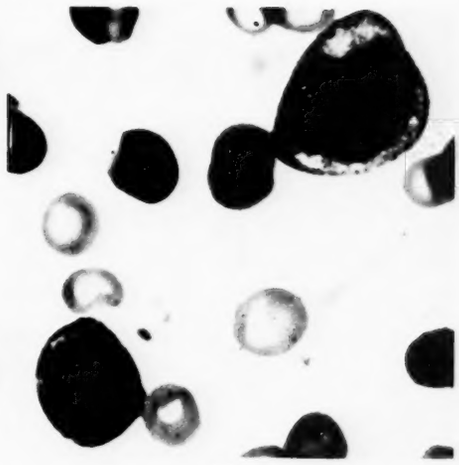


FIG. 3.

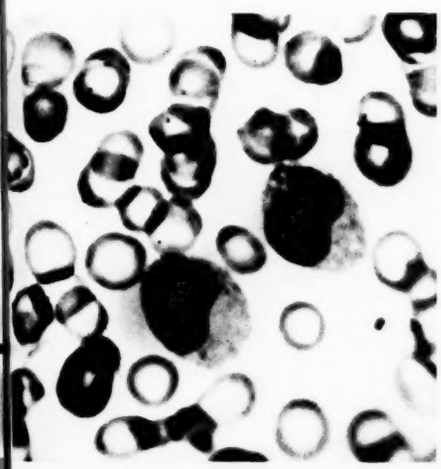


FIG. 4.

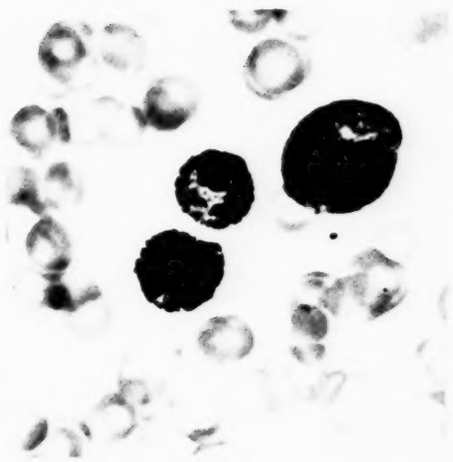


FIG. 5

LEGENDS.—FIG. 1.—Case I, monocytic leukaemia, monocyte and two immature monocytes. FIG. 2.—Case I, two lobulated monocytes and a monoblast. FIG. 3.—Case I, large immature monocyte and a monoblast. FIG. 4.—Case II, infectious mononucleosis: two immature monocytes. FIG. 5.—Case II, large abnormal mononuclear with dark blue cytoplasm and two polymorphonuclear cells. (Magnification approximately × 750.)

E. H. RAINEY AND A. GEOFFREY SHERA: TRIPLE PREGNANCY WITH EXTRA-UTERINE TWINS

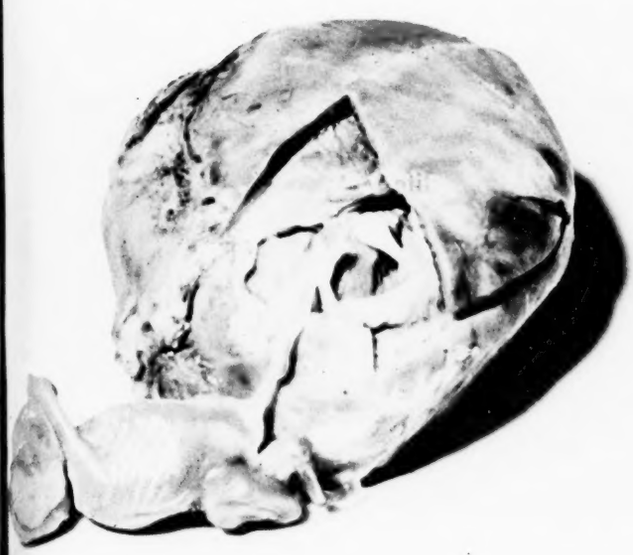


FIG. 1.

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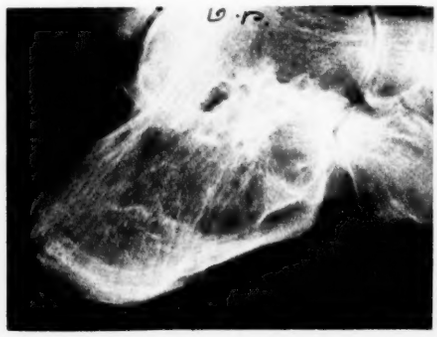

FIG. 3.

FIG. 4.

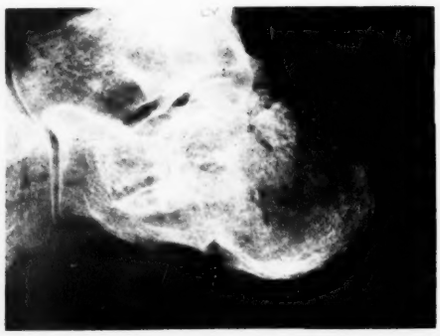

FIG. 5.

FIG. 6.

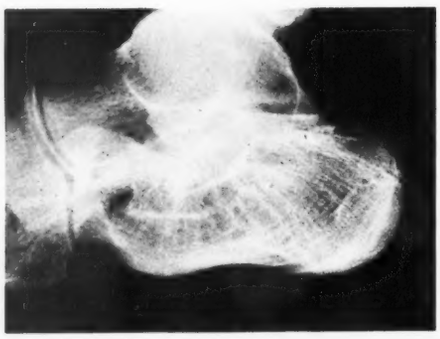

FIG. 7.

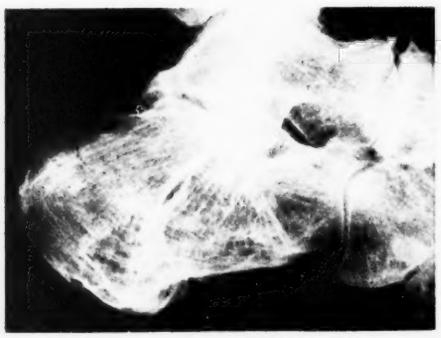

FIG. 8.

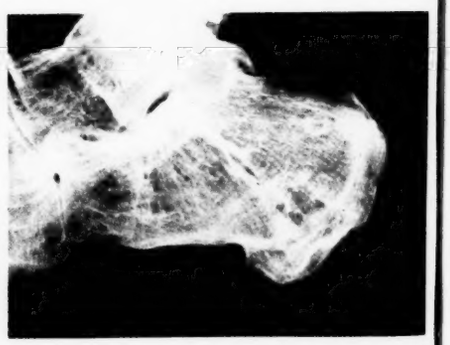

FIG. 9.

FIG. 10.

LEGENDS.—FIG. 1: Avulsion fracture of the os calcis. Accurate re-position usually followed by a good result. FIG. 2: Crush fracture of the os calcis with comminution and displacement—the type of fracture which presents difficulty both as regards period of incapacity and permanent defect. FIG. 3: Some months after arthrodesis of left subastragaloid joint. FIG. 4: Some months after arthrodesis of right subastragaloid and mid-tarsal joints. FIG. 5: *X*-ray result of crush fracture of the os calcis with comminution and displacement two months after injury. FIG. 6: *X*-ray three months after comminuted fracture of os calcis with displacement and involvement of the subastragaloid joint. Good clinical function. Treatment described in text. FIG. 7: *X*-ray some months after a crush fracture of the os calcis, showing subastragaloid arthritis and deformity of the os calcis, comparatively short disability, and eventually no symptoms. FIG. 8: Same case as Fig. 9. There is subastragaloid arthritis and deformity of the os calcis. At the time of the injury this side was unnoticed and it was not treated. He makes no complaint of it. FIG. 9: *X*-ray taken many months after the fracture. Note the arthritis and deformity. This foot was treated in a walking plaster. He has the usual complaints. Fig. 8 shows his other foot, which was similarly injured. FIG. 10: Subastragaloid arthrodesis performed in 1932. *X*-ray, 7/9/35, shows result and also the amount of arthritis which has since occurred in the mid-tarsal joint. There has been no improvement in his working capacity.

HEALTH OF THE ARMY

REPORT FOR 1935

The general health of the military forces continued excellent during 1935, and in the annual report on the Army[1] for that year it is mentioned that the ratio of admissions to hospital was 392.1 of the strength, or 10.5 per cent. lower than in 1934, which was the healthiest year since the war. The death and invaliding ratios also showed slight reductions, but there was a very small increase (0.29 per cent.) in the numbers constantly sick. As in former years, the report contains three main divisions: a general survey of the troops at home and abroad, with notes on special diseases; statements about the work of special departments—namely, medicine, surgery, women and children, hygiene, pathology, dental treatment, and medical examination of recruits; and notes on the health of the Army in the various commands at home and abroad.

Incidence of Diseases

The principal causes of admission to hospital were inflammation of areolar tissues, inflammation of the tonsils, and venereal diseases. There were slight increases in the admission ratio in respect of skin diseases, nasal catarrhs, soft chancres, dysentery, and gonorrhoea, but marked decreases in cases of inflammations of the tonsils and pharynx and in malaria. There was a rather smaller decline in the incidence of diseases of the areolar tissues and local injuries. The deaths numbered 370, corresponding to 2 per 1,000 of the strength, as compared with 2.1 in 1934 and 2.3 for the period 1930-4. Judged by the average sick time for each soldier the least healthy commands were those of Jamaica, Ceylon, Mauritius, Malaya, and China, while those with the lowest ratios were Bermuda, Malta, and Gibraltar. Dysentery increased, but was mild in character; next to malaria bacillary dysentery is considered to be the most important disease in the Army abroad, being one which may assume serious proportions under active service conditions. Amoebic hepatitis and tropical liver abscess, which used to be so serious, have now been brought much better under control by modern scientific methods of diagnosis affording facilities for prompter treatment. Malaria dropped from 4,272 cases in 1934 to 3,549 in the year under review, the figures for India being the most satisfactory yet recorded despite active field operations on the frontier in malarial areas. Reference is made to the great value of atebrin treatment. The number of cases nearly doubled in Ceylon, however, in association with the general epidemic among the civilian population. Pyrexia of undetermined origin still presents a diagnostic problem in India, as also does sand-fly fever.

There was a slight increase in the total number of cases of pulmonary tuberculosis, and it is noted that there is a higher incidence in the Foot Guards, the Royal Army Medical Corps, and the Royal Army Ordnance Corps than in the rest of the Army. The age period from 45 upwards has a ratio of 3.3 per cent., which is greatly in excess of that for young soldiers. There was a slight increase in the incidence of venereal disease, the admission ratio having risen from 24.2 in 1934 to 27 in 1935, but it is still lower than the average of the five preceding years. Work at Woolwich on the preparation of a mixed polyvalent vaccine of secondary organisms isolated from cases of gonorrhoea and non-venereal urethritis indicates that this vaccine may aid in reducing the stay in hospital for this intractable disease. Functional neurosis admissions increased, but there was no change in the incidence of acute psychoses, of which the most important is schizophrenia. There was a satisfactory decline in the incidence of rheumatic fever. The risks of rheumatic carditis in young soldiers have been much diminished by enforcing prolonged rest before return to active exercise is permitted. In the treatment of fractures, open operations, especially plating, have been very largely abandoned; fixation of the fragments by pins or wire and the employment of the non-padded plaster case are coming into more frequent use.

[1] Report on the Health of the Army for 1935. Volume LXXI. H.M. Stationery Office. (3s.)

Special Departments

The present system of specialization in medicine has been at work for fourteen years with very satisfactory results; young officers are being trained as specialists and graded for appointments. Three centres for cardiological investigation and diagnosis have been established in London, Aldershot, and Catterick under the supervision of the medical specialist of the area, and patients needing particular attention are sent to the appropriate centre. Since the situation of these centres corresponds to the main recruiting areas, a check upon the enlistment of doubtful cases of cardiac disease is readily available. These centres also provide valuable opportunities for officers who propose to specialize in medicine to gain a knowledge of cardiovascular disease and to work directly under a specialist before joining the senior course of training at the Royal Army Medical College. In the first year's working at Millbank 208 cases were examined and 202 electrocardiographic records were taken, of which 36 showed evidence of abnormal conditions of the heart. It is expected that these centres will become of increasing importance, more particularly in reducing the numbers of discharges for cardiac insufficiency among recruits with less than six months' service. In the section of the report devoted to surgery reference is made to the great value of the clinics for the injection treatment of varicose veins and haemorrhoids. In the surgical work arising from the Quetta earthquake plaster-of-Paris casts were found to be superior to the usual cumbersome splint method in the transport of fracture cases, and more satisfactory end-results followed subsequent treatment. Glucose stovaine spinal anaesthesia was found useful at the Cambridge Hospital, and intravenous sodium evipan gave good results there and at Woolwich. Percaine administration was similarly approved at Woolwich and Netley. Radiological examinations were performed in 25,761 cases at home and in 23,449 cases in India, great saving in costs being effected by the increasing use of paper film negatives. New apparatus was installed during 1935 at Woolwich and Netley. There was an increased amount of work in the massage and electrotherapeutic departments, and the massage school at Netley was reorganized.

Miscellaneous Matters

In the hygiene section of the report it is noted that a new departure in barrack construction known as the Sandhurst block has been evolved, which incorporates many improvements making for the health and comfort of the men: a central boiler provides hot water for the baths and ablution rooms, with a steam supply for the cookers and for central heating. A committee was appointed to deal more effectively with the feeding of small detachments and individuals, and the ice ration has been extended to several stations abroad which formerly received no free supply; these better facilities for preserving food have given general satisfaction.

The Harold-McKibbin ammonia-chlorine method of water sterilization has replaced the chlorine method as the standard method in the Army. Efforts are being made to provide more and safer swimming baths. At Aldershot, for the first time on record, cases of leptospirosis occurred in connexion with the military swimming pools, possibly because the very dry summer of 1935 lowered the water level and involved more contact with the subjacent mud which had been infested by rats. Contamination of the sea beaches at Hong Kong caused some anxiety. Closed subsoil drainage arrangements have come more into favour in barracks in Malaya. As regards physical training, it was shown at Aldershot that deep-breathing exercises in association with gymnastic practices did not improve the vital capacity; dorsal stretching exercises have been found to be liable to cause injuries, and they are being replaced by true concentric dorsal exercises.

The total percentage rejection of potential recruits on medical and physical grounds in 1935 was 43.4 as compared with 52 in the previous year, the main defects found being gross under-standards for height, weight, and chest measurements, seriously defective vision, loss or decay of many teeth, and marked physical deformities.

THE BRITISH SEA CLIMATE

HEALTH RESORTS CONFERENCE AT BOURNEMOUTH

Bournemouth at the week-end entertained a large number of medical men and others from various parts of the country, the occasion being a conference of the British Health Resorts Association, which exists to underline the merits of British spas and coasts. Even in a wintry March Bournemouth appeared as charming as usual; as one speaker said, Bournemouth is never out of season, and is no curtained or shuttered town in winter and early spring. Care was taken to ensure that the visitors, in spite of two sessions of discussion, saw as much as possible of its natural advantages and its progressive spirit. The latest example of the latter is an establishment for indoor bathing, to be opened at Easter. This is a fine addition architecturally to the sea front, has cost £80,000, and includes a swimming pool, 100 ft. by 35 ft., surrounded by terraced seating accommodation for 600 spectators. In addition a variety of private baths have been provided, with a solarium.

Wintering in England

The opening of the conference was presided over by the Mayor of Bournemouth, supported by the Mayors of Poole and Christchurch, and the first meeting was devoted to a discussion on "Wintering in England." The principal speaker was Lord HORDER, who came to express his faith in the winter as well as summer value of British resorts, having in mind particularly the southern seaboard. Climatically the South Coast, he said, had many advantages irrespective of the rather elemental question whether the sun shone or not. But when doctors were asked by their convalescent patients and others where they should go there was not much exact knowledge to guide them. The members of the medical profession wanted to know "whom to send where." "Change of air" did a large number of people good and some people harm, but it was difficult to say what change of air was likely to suit which person. A colleague of his, now retired from a lucrative practice, had a flair for knowing where to send a patient. He could only explain it, "It just comes to me. I look at them. They tell me they never sleep at A, and always get indigestion at B, and I send them without hesitation to Y or Z." It was an example of empiricism. Lord Horder said that he himself had coveted but never possessed the gift. It was a matter on which doctors residing and practising in resorts might pool their experiences.

Lord Horder also had some advice to offer on the subject of hotels—a matter which evidently presents many sensitive surfaces. Where, he asked, was the old English inn, the inn of Dickens, and Fielding, and Smollett, and Charles Lamb? One speaker answered that licensing restrictions had killed it, which evoked the comment in another quarter that these noisy and rollicking places would hardly suit the invalid in search of repose. On the subject of noise also Lord Horder had something to say, and congratulated Bournemouth on substituting the quieter trolley-bus for the grinding tram.

Sir JAMES MARCHANT treated the conference to a very eloquent address on the charms of the South Coast. He mentioned a suggestion made by Sir Leonard Hill that hotels might put up spacious verandas with moving screens for wind protection, warm them with radiant heat, and install mercury vapour lamps to give an ultra-violet radiation equal to sunlight.

Meteorological Records

The need for research at winter marine resorts was stressed by Dr. K. R. COLLIS HALLOWES of Torquay. He spoke in particular of meteorological figures. All meteorological stations should be controlled by the Meteorological Office. At some resorts the station was not under such control. Records taken primarily for publicity purposes might have little other value, giving "pocket-climate" averages not comparable with those of other resorts. Even at controlled stations along the coasts the altitudes at which meteorological instruments were placed varied from 190 feet to 5 feet above sea-level. Earth temperatures were taken at some resorts and not at others. Some resorts recorded ground frosts and gales, others did not. At some the temperature of the sea was taken in shallow water from the beaches, at others in deep water from the pier. Thunderstorm statistics were apt to vary according to the opinions of the observer. At present the figures recorded for ultra-violet light were of problematical value, as the method used was not recognized by the Meteorological Office, and the recording tubes were likely to be differently read by different observers.

Dr. Hallowes also referred to the fact that the readings for a seaside day were often not those which would be recorded for the "invalid's day" (between 9 a.m. and 5 p.m. during the winter months). Few readings were taken at meteorological stations during those hours. Temperature and humidity records ought to be made during hours when invalids and others were out of doors. No accurate estimation of the number of rain days at any resort could be made without defining how many hours of rain there were in the "invalid's day," quite irrespective of the amount of rain which fell in the twenty-four hours. Another point made by Dr. Hallowes was that the elevation and exposure of hotels and boarding houses should be accurately stated. Hotels should also state whether they catered for invalids or not. Some hotels wanted invalids and catered for them, some did not want them and said so, and a few received them and did not cater for them.

In some general discussion the deficiencies of health resorts in some respects were frankly canvassed. Sir JOHN ATKINS mentioned receiving a letter from a patient whom he had sent to a health resort. "For some time I have had a suspicion you were getting tired of me, and now I am convinced of it. I can think of no other explanation why you should have sent me to this deadly dull place unless you thought I should shoot myself and so save you further trouble!" Dr. G. DE BEC TURTLE mentioned the value of sending the patient to a health resort in or near his native locality. It was generally of little use, for example, sending a son or daughter of East Anglia to the Cornish coasts. Dr. ALFRED COX, the secretary of the British Health Resorts Association, pointed out that a good many British health resorts did not set out to attract those seeking health; they were content to do that which required no particular exertion—namely, to entertain the visitors who came to them in shoals at holiday times. They were deliberately neglecting a great opportunity to make their seasons longer and their towns more prosperous.

Effects of Marine Climate

Dr. OTTO KESTNER of the Rowett Institute, Aberdeen, formerly professor of physiology, University of Hamburg, gave a paper on the curative action of sea climate. He described some investigations in the health resort of Wyk on the island of Föhr in the German North Sea, to which reference was made in the lecture published in last week's *British Medical Journal* (p. 555). The action of sea climate on the skin was well worthy of study. As Professor Kestner put it, under the stimulus of sea, sun, cold air, and cold water the capillaries of the skin learned gymnastics again, and the children could bathe in the sea and play naked in the open air, even in winter, without a decrease of body temperature. He referred to the work of Curschmann, who was now continuing on the Baltic Sea the work begun on the North Sea, eliciting that while the blood pressure of normal persons was neither increased nor lowered by sea bathing, in patients with high pressure such pressure was decreased, and could be decreased over a considerable time by repeated sea bathing. Curschmann called the seashore the "hypertonic's paradise."

Climates and Clinical Conditions

Sir WALTER LANGDON-BROWN said that the effects of a marine climate on children, for which Professor Kestner had given exact and scientific data, had long been empirically recognized in England, and the South Coast had been the favourite situation for preparatory schools. Marine climates, while in general providing humidity, purity of air, and freedom from dust, could be divided into the cooler more bracing type and the warmer more sedative type. To a certain extent the whole of Great Britain had some of the advantages of a marine climate, for no part of the island was more than sixty miles from the sea. Not that it was to be claimed that the seaside offered a panacea in the way of climate. Gouty subjects usually did better at an inland resort, as did those suffering from certain skin diseases. Some paroxysmal neuroses did not do well, though in this respect, as in so many others, the asthmatic persisted in expressing his idiosyncrasy. It was sometimes said that certain cases of insomnia did not do well at the sea, but he thought this applied only to bracing marine climates. At any rate he had found Bournemouth increase the capacity for sound sleep. For chronic bronchitis and emphysema the conditions provided at Bournemouth by equable temperature, humidity, and pine-laden breezes were admirable. Michael Foster had said that the more sedative and sheltered localities of the south were of great value as winter quarters also for cases of heart disease. This should be interpreted not to include those with any suspicion of active rheumatic carditis, for which it did not seem suitable; rather must they think of those with failure of the heart muscle, whether due to old and quiescent valvular disease or to hypertension. Finally, Sir Walter Langdon-Brown referred to the "diseases of civilization"—hypertension, hyperthyroidism, diabetes, and peptic ulcer. For all these a marine climate of the type provided at Bournemouth formed a useful part of treatment.

Where Bournemouth is Indicated

Dr. S. WATSON SMITH of Bournemouth finally gave a careful survey of the differing values of British sea climates—the east coast of Scotland and the east, south-east, and south-west coasts of England. For Bournemouth itself he claimed not one but a number of climates—the centre of the town, in one of the several chines to the north of the town, or on the uplands behind. The newcomer to the Bournemouth district was often heard to complain of drowsiness with disinclination for effort and an inability to summon up energy to do more than half a day's work. Thus the place had been called enervating when in fact the soothing sedative climate might be exactly suitable to him if a plethoric person or with high blood pressure. Those suffering from the nervous disorders associated with the climacteric did well at a place like Bournemouth. As to whether the climate was suitable for rheumatic subjects, certainly rheumatic fever and acute articular rheumatism were practically unknown at Bournemouth. Rheumatoid arthritis and osteo-arthritis were not difficult to arrest in that climate, but fibrositis was best treated at a spa. Dr. MAHOMED of Bournemouth added a few interesting experiences of the local climate.

A banquet was given at the Pavilion by the Mayor and Corporation in connexion with the conference. Dr. W. ASTEN, chairman of the Health Committee of the county borough, proposed the principal toast, that of "The British Health Resorts Association," and referred to the ever closer relationship between the medical profession and the work of local authorities. This mingling of voluntary and official effort was warmly to be welcomed, though he hoped and believed it would always stop short of the complete merging of the medical profession into a State service. Sir WALTER LANGDON-BROWN made a happy speech in reply, in the course of which he paid a tribute to the late Colonel R. H. Elliot, the real founder of the association, who was, he said, among other things, an excellent amateur conjurer, and one of the greatest feats of conjuring he ever did was to make the British people proud of their health resorts.

Sir ARCHIBALD WEIGALL proposed the health of the Corporation, and made some observations on the importance of local government and the desirability that it should be of a non-party character. The MAYOR OF BOURNEMOUTH replied, warmly upholding the excellence of British hotels as compared with their Continental rivals. Among the guests at the banquet were Sir Kaye and Lady Le Fleming and a number of others from Bournemouth and the locality.

GAS-AND-AIR ANALGESIA IN LABOUR

INVESTIGATION AT BARNET

For nearly three years at the Wellhouse Hospital, Barnet, an investigation has been proceeding into the value of gas-and-air analgesia in labour. From time to time we have given publicity to this work, and we have now received a copy of a report made by Dr. John Elam, visiting anaesthetist to the hospital, to the medical superintendent, Dr. Roland Segar, which has been forwarded to the Barnet Guardians Committee and the conclusions of which have also been presented to a special conference held recently at the Midwives Institute. A series of 1,065 maternity patients have been taken, 625 of whom were primiparae, and of this number 648 (410 primiparae) experienced no pain after gas and air had been started. 402 (207 primiparae) found great relief, and only fifteen were disappointed.

The object of the investigation was to find a method of affording relief from the pains of labour which would be absolutely safe and could be used by nurses or midwives without the necessity for the presence of a medical practitioner. The use of gas-and-air analgesia was first tried in October, 1933, by Dr. Minnitt of Liverpool, who adapted for his use an American nitrous oxide apparatus. The Wellhouse Hospital immediately had a similar machine made, and was, in fact, the first hospital in the South of England to employ the method. It is emphasized in Dr. Elam's report that the whole of this work has been carried through by midwives and nurses, and thanks are expressed to these members of the staff for their co-operation in a procedure which must have added considerably to their responsibilities.

First Stage of Labour

For the first stage of labour this form of analgesia is hardly practicable administratively, owing to the necessity of having the nurse or midwife in continuous attendance over perhaps a prolonged period; the high cost of the gas consumed per case would also be a consideration, and there are other technical difficulties. For this first stage of labour it is considered better to rely on the use of sedative drugs such as morphine, which give reasonable relief. It is in the second stage that gas and air proves its special value, when the pains are becoming strong and frequent, and the patient is brought to the labour ward. The causes of the few failures have been carefully investigated. Some of them are due to the patient herself, her unwillingness to co-operate, or her nervous temperament or unsuitable type (the heavy athletic type is peculiarly unresponsive to gas, and requires a higher percentage of nitrous oxide in the air than is usually given), and some to faulty administration, imperfect technique, failure of the facepiece to fit the patient comfortably, and so forth. For the great majority of women, however, the method affords marked relief. In this series of cases no deaths occurred which could be attributed in any way to the analgesia, nor was there any increase in the forceps rate or the number of stillbirths.

Expense and Applicability

Attention is drawn to the test carried out by the British College of Obstetricians and Gynaecologists (*Journal*, February 8, 1936, p. 273), in which it was stated that gas and air administered by the Minnitt apparatus was a safe and satisfactory method. At the same time mention was made of the expensiveneses of the nitrous oxide. The figures at Wellhouse, however, do not seem to be very formidable. The total cost for gas to the maternity unit over the investigation lasting nearly three years was £117, working out at 2s. 3d. per case.

The value of the method in hospital use having been established, the question now arises as to its applicability to the large number of women attended by midwives in their own homes. Dr. Elam mentions a machine made by the Dental Manufacturing Company specially for Wellhouse, described with illustrations in the *Journal* of September 26, 1936 (p. 630). This is a portable machine in the sense that, complete with gas cylinders, it weighs only 20 lb., and can be easily attached to the handle-bars of the midwife's bicycle. Dr. Elam expresses the hope that finality has not been reached. Further work has yet to be done in providing some sedative drug for giving relief in the early stage of labour and to eliminate the causes of failure to obtain adequate relief in the second stage.

Reports of Societies

EFFECTS OF PROLONGED DORSAL DECUBITUS

At a meeting of the Medical Society of London on March 8, with Mr. W. E. TANNER in the chair, a discussion took place on the effects of prolonged dorsal decubitus.

Mr. G. R. GIRDLESTONE of Wingfield-Morris Orthopaedic Hospital, Oxford, said that evidence of statistical value on this subject would be difficult to obtain; he had therefore to rely on the investigation of a relatively small group of cases and on clinical experience. On the question of the shape of the thorax resulting from dorsal decubitus opinions rather differed. Two colleagues had mentioned some antero-posterior flattening, which had been countered in one case by exercises and in the other by the subsequent adoption of the ventral position. But in twenty patients who had been out of hospital for more than a year, and who previously had been in dorsal decubitus for more than a year, no abnormality in the shape of the thorax was detected. Various abnormalities had been recorded in the lower limbs, but these were mostly a matter of control, partly by splintage and partly by nursing attention. In the old-fashioned bed with the body inadequately supported and the nursing inadequate such developments as flexion deformity of the hips, pes cavus, dropped metatarsal heads, and claw-toes took place, but among the twenty patients just mentioned only one continued to show such a deformity (slight cavus). Lordosis of the spine might be brought about very easily by an unrecognized flexion deformity of the hip, and a fixed lordosis was almost impossible to correct by passive movements. Scoliosis was another insidious development, usually arising from an organic cause, but sometimes following nursing without maintenance of the anatomical position of the pelvis.

Patients who had been for a long time on their backs were more than usually sensitive to shock during and after prolonged operations. He had been unable to trace any lowering of blood pressure from prolonged dorsal decubitus. No abnormality of the function of the kidneys as a result of posture had been noticed. Dorsal decubitus predisposed to renal calculi, the incidence of which was abnormally high in orthopaedic hospitals. But here two factors were at work—namely, posture and infection. In his own hospital, with probably one hundred patients in dorsal decubitus, there had been only eight cases of stone in ten years, and during the last five years, with special measures of precaution instituted, he could find only one case in which stone had developed in the hospital.

Bed-sores used to be a common effect of prolonged dorsal decubitus. In orthopaedic hospitals they were now very rare, thanks largely to highly trained nursing. In his own hospital there had been only one case of the kind during the last few years, a case presenting an incurable and most persistent trouble. Finally, there was a psychological factor to be considered in these patients. What was the effect of prolonged dorsal decubitus on the mind? A great deal could be done by the design of wards and provision of occupation to make time pass purposefully and even pleasantly, for Nature seemed to give an extra allowance of patience and courage to meet the tedium of prolonged recumbency.

Renal Calculi

Mr. JOHN EVERIDGE said that as consulting urologist to the Carshalton Hospital he had seen a number of cases of renal calculi associated with dorsal decubitus. He had worked with Dr. Pugh, who evolved the excellent frame which had done so much to diminish the incidence. It was rather strange that more attention had not been drawn to this distressing complication. He could find no reference to it previous to the war, and only brief allusions since. The cases at Carshalton were mainly those of tuberculosis of spine or hip, but there were some cases of septic arthritis. The majority of the patients had been treated for a considerable time at other orthopaedic centres, and on admission there might already be evidence of the existence of stone. In the vast majority urinary sepsis complicated the picture, the organisms found being chiefly *B. coli* and occasionally *B. proteus*. Urinary sepsis was very prone to occur in children kept on their backs, especially girls. It was difficult to avoid contamination during defaecation, and there was little doubt that the infection was an ascending one by way of the urethra. Apart from the cases of stone, a large number had pyuria. In many of the cases the stones gave no pain, and the condition was brought to light by a painless haematuria. The prognosis was bad, but not perhaps quite so bad as might be imagined. There were many cases of what appeared on *x*-ray examination to be huge calculi, but when the children got up the shadows completely disappeared. It was assumed that such shadows were not due to formed calculi but to a silting up or the formation of what were called mud stones, and when the children got up and normal metabolism was restored this mud came away. But even formed stones came away to some extent.

General Discussion

Mr. WOODD WALKER said that it seemed unlikely that gravity should make any difference to the emptying of the pelvis of the kidney. There was very little evidence that the upright position of man as compared with animals made any difference to kidney drainage. Dr. G. VILVANDRE said that with disuse there was marked decalcification of the bones, and it was this which led to the formation of calculi. Mr. A. SIMPSON-SMITH maintained that posture or gravity must have a very important bearing on the subject. He added that during the past three years at the Lord Mayor Treloar's Hospital at Alton he had seen about half a dozen cases of renal calculi in tuberculous spines.

Mr. WHITCHURCH HOWELL spoke of children suffering from dislocation of the hip. His attention was drawn to the subject in 1920 by seeing a child with a bilateral dislocation of the hip-joint in whom, for a few weeks after reduction, haematuria occurred and renal calculi developed in both kidneys. He then devised a pelvic rest arrangement by which, as soon as the child was recovered from the anaesthetic after reduction, Fowler's position was maintained and a hinged support enabled the action of gravity to take place. Since then he had had no cases of renal calculi or haematuria. Patients in the old days were kept

for so long on their backs that their cardiac efficiency was decreased. But children with congenital dislocation of the hip kept in the position he had mentioned experienced no cardiac inefficiency. Many of the cases were treated on the Bradford frame—a steel tubular oblong the shape of the bedstead. He had designed a framework in which a Bradford frame was suspended on pulleys so that certain turning movements in different directions were possible. One important point was that children who were continually recumbent often did not get sufficient fluids and became more and more constipated. The cases also called for attention from the psychological point of view. Much might be done by attention to the surfaces on which their eyes were generally resting, and by some arrangement of mirrors life might be made more interesting for them. The device of prismatic spectacles whereby it was made possible to read in bed with the book held in a natural position was a great boon.

Mr. F. McG. LOUGHNANE did not think that the decubitus position had very much to do with the formation of stone in the kidney. Much had been heard about dehydration and sunlight leading to the formation of stone, but in Mesopotamia during the war, where there was plenty of sun and everybody was being dehydrated, he came across only two cases of urinary calculus in four years. He was very sceptical also about renal calculus disappearing on the resumption of an upright position.

Mr. GIRDLESTONE said that he did not think much of the ingenious theory of disuse atrophy which had been put forward. The amount of calcium which passed into the blood stream from bone in any one day must be extremely small.

EXTRACTS OF LIVER AND YEAST IN MACROCYTIC ANAEMIA

At a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on March 9, Dr. DOROTHY HARE presiding, Dr. LUCY WILLS read a paper on extracts of liver and yeast and their varying efficiency in the treatment of macrocytic anaemia.

Dr. Wills reviewed the differences between pernicious anaemia and tropical macrocytic anaemia, and pointed out the similarity between the latter and the nutritional anaemia of *rhesus* monkeys. To investigate the haemopoietic activity of various liver and yeast preparations anaemic monkeys were used as test animals and control experiments were arranged on cases of pernicious anaemia. Crude extracts of liver and yeast were active in both conditions, those from yeast in the case of pernicious anaemia only if given with normal gastric juice. The use of more highly purified extracts of both substances resulted in the separation of two factors, one insoluble and one soluble in ammonium sulphate; the former was active in pernicious anaemia and inactive in the monkey anaemia, and the latter was active in the animal condition and had not yet been tested on cases of pernicious anaemia. In addition to the animal anaemia certain monkeys which gave a good reticulocyte response when treated with purified extracts showed signs of a vitamin B_1 deficiency, conditioned possibly by the increased metabolism associated with the reticulocytosis.

The author exhibited graphs showing the effect on monkeys first of anahaemin (Dakin and West's highly purified liver fraction) and then of campolon. The former in monkeys was negative, the latter—in monkeys as in man—was frequently life-saving. The work suggested that there were at least two haemopoietic factors in all extracts. It was only when the principles concerned were obtained in their pure form that their different actions became clear. The very marked improvement in the animals when crude extracts were given was significant. As in human beings, long before the blood improved there was improvement in the clinical condition of the animal, and one expected it to get better. The clinical improvement was less marked with the use of the more purified extracts. It seemed, therefore, that until the treatment of the tropical condition had been clarified it was well to use the cruder extracts, and the same might be true in certain cases of pernicious anaemia. A trial of anahaemin had been arranged to take place in the Tropics.

Tropical Anaemias

Dr. HAMILTON FAIRLEY said that these macrocytic anaemias played quite a large part in tropical practice. The three types of anaemia which had been encountered were the tropical macrocytic anaemia, tropical sprue, and another anaemia associated apparently with malarial infection, not improbably a tropical macrocytic anaemia with malaria superadded. Until recently tropical macrocytic anaemia had been regarded as occurring only in places like India, Africa, and China. Recently he was in Macedonia investigating blackwater fever, and there in adjacent wards he came across two cases of undoubted macrocytic anaemia associated with malaria; quite probably these were tropical macrocytic anaemias. The condition was quite common in the Balkans. He could not help feeling that a great deal of work remained to be done from the clinical side on these anaemias in the Tropics before the problem was adequately solved.

Dr. JANET VAUGHAN said that personally if she suffered from pernicious anaemia nothing would induce her to be treated with anahaemin; she would prefer less pure preparations. She also calculated that it would have cost her £7 to cure her last patient with anahaemin; campolon would have cost much less. Anahaemin marked a scientific advance, but she was doubtful whether it marked an outstanding therapeutic one. The latest work suggested that in liver a very complicated substance was being dealt with, and it was safer for the present to treat patients with the relatively crude extracts which presumably contained all the principles—three had now been isolated—than to use the purer extracts which, so far as known, did not contain all the haemopoietic factors. People should realize the danger of treating patients with these highly clarified fractions.

Absorption and Excretion

Professor E. C. DODDS asked whether it was possible that the reason why the very pure preparations were not as good as the cruder ones was because they were more rapidly excreted. On a different line of work, with a substance like the ovarian hormone, in the old days, a crude preparation being used of the constitution of which nothing was known, one injection would give oestrus, but now with one injection of the crystalline substance, owing to the rapid absorption and excretion, oestrus would not be obtained. Thus it might have been said that the old crude extracts contained substances which the pure crystalline preparations did not, but that was not the secret.

Dr. S. W. F. UNDERHILL said that theoretically it would certainly seem that the cruder preparation should be absorbed more slowly, but actually it had been found that anahaemin in quite small injections—1 c.cm. a month—would maintain cases of pernicious anaemia. There must be some means of storing the substance in the body, for it was inconceivable that it should remain at the site of injection for that length of time. A further point on this question of the use of crude and purified extracts was that with the purified extracts there was shown from batch to batch certain well-marked characteristics such as melting point and especially rotation, and from experience it had been found that if they showed rotation it was a very good indication of clinical activity, whereas there was no real chemical or physical test in the case of the crude extracts on which reliance could be placed.

Relation Between Pituitary and Gastric Secretion

At the same meeting Dr. R. L. NOBLE presented a brief communication by himself and Professor E. C. DODDS on the relation between the pituitary and gastric secretion. Severe gastric lesions in animals had been produced by posterior pituitary extracts. The lesion was only obtained

when hydrochloric acid was present in the stomach contents, but it was primarily related to a sudden cessation of gastric secretion. The authors discussed the normal gastric response to insulin, histamine, and sham feeding in a large series of animals. The action of insulin had been tested on eleven such animals. Following an injection of two units subcutaneously there was definite stimulation of the gastric juice. This secretion appeared to be of nervous origin; any anaesthetic prevented the effect. The stimulation produced an increase in all the contents of the gastric juice; the pepsin activity might be increased from fifty to one hundred times. It was quite different with histamine, where there was only an increase of acidity. The action of pituitary extracts on normal secretion had been investigated. The vasopressor fraction had been found markedly to reduce the secretory response from all types of stimuli. It was possible by this means to produce for a time a condition of achlorhydria during which even the most potent gastric stimulus—histamine—would not induce any secretion.

Professor DODDS said that one object in bringing this work forward was to elicit the experience of others as to any known complete inhibitor of gastric secretion. As far as they had been able to ascertain this pituitrin was the only substance which would inhibit every type of stimulus to gastric secretion. In answer to Dr. Lucy Wills he said that control experiments had shown that extract of thyroid had no effect at all.

ANAESTHESIA IN AMERICA

At a meeting of the Section of Anaesthetics of the Royal Society of Medicine on March 5, under the presidency of Mr. LANGTON HEWER, several members gave their impressions concerning anaesthesia in the United States and Canada.

Dr. R. R. MACINTOSH, who was warmly congratulated on his appointment as Nuffield Professor of Anaesthetics, said that in the United States the nurse-anaesthetist was very largely employed, and this created an economic situation which was not satisfactory to the private anaesthetist. Skilled anaesthetists in America were not adequately rewarded for their services; their fees were lower than those of their British confreres. Many of the large hospitals had numbers of paying rooms and wards, and the class of patients operated upon in this country gratuitously were required in the United States to pay a small fee. Most of the work of the anaesthetist was done in the hospitals, where his apparatus also was stored, and he was spared the trouble of taking it about to private houses, as most serious sickness was treated in some institution. In many cases the fees for private work were collected by the hospitals, and in this way bad debts were avoided. Many people on the "other side" had an idea that the giving of anaesthetics needed no more skill and training than giving a hypodermic injection or an enema. The employment of the nurse-anaesthetist did not meet with the approval of the medical profession as a whole, nor, in particular, of the Society of Anaesthetists. Most of the women doing this work were well trained and competent, and his opinion was that they were infinitely better anaesthetists than were general practitioners who only occasionally gave an anaesthetic. Nurses, however, were not allowed to give intravenous or intrathecal injections. If at the present time the nurse-anaesthetist were abolished there would not be nearly enough fully qualified men to do the work. The rewards offered in this specialty were not large enough to attract students to it. At Toledo a high skill had been attained in gas-and-oxygen anaesthesia; perhaps, indeed, it was overdone there, whereas in this country it was not used enough. At Toledo it was considered that the colour of the patient was no indication of the depth of the anaesthesia. Certain schools in America seemed to make the same mistake which was made by some in England: they confined themselves too rigidly to one or two kinds of anaesthetics.

Experiences in Canada

Dr. H. W. FEATHERSTONE based his remarks on visits he had paid to hospitals at Toronto and Winnipeg, and especially the Mayo Clinic at Rochester. He did not see chloroform used at all; ether was employed by the anaesthetist-nurse and by interns. Atropine was rarely used before operation, but morphine and scopolamine were often so employed. Abdominal relaxation was not called for so insistently as in this country. In Canada he found that a cautious attitude was adopted towards new methods. At the Mayo Clinic acute conditions, such as fractures and appendicitis, were comparatively rare, for the reason that Rochester was only a small town, and acute cases could only be brought from the immediate neighbourhood because of the time factor. In an establishment of 1,800 beds there were only three fully qualified and trained anaesthetists. In the U.S.A. and Canada people with major medical and surgical conditions expected to enter hospitals for their treatment, and maternity cases of all grades of society were attended to in the maternity hospitals. The proper assessment of the state of the anaesthetizing specialty was based on the general average excellence in routine work.

Premedication

Dr. J. T. HUNTER spoke of his experiences at the Crile Clinic at Cleveland and the Lahey Clinic at Boston. He said he never saw a bottle of chloroform during the whole time he was in the States. At the former clinic the work of the nurse-anaesthetist was not medically supervised, and there nitrous oxide was largely used; for abdominal operations a good deal of ether was added. At the Lahey Clinic he was greatly impressed by the thoroughness of the detailed examination of patients and the completeness of the records kept. The premedication doses used there were only about half those employed in this country; a usual dosage was 1/12 to 1/8 grain morphine and 1/100 grain scopolamine. In almost every hospital the continuous-flow type of machine was used. In America the anaesthetist had the full support of the staff, and in carrying out designs for new apparatus engineers gave their collaboration. In England, on the other hand, the inventor-anaesthetist had to bear the cost himself. With the research and the excellent tuition carried on in the States their results within a few years should be second to none in the world.

Dr. W. STANLEY SYKES mentioned the lavish and beautiful equipment for anaesthesia to be seen in many hospitals. Anaesthesia in the States, however, was not of universally consistent quality. There were many places where it was badly neglected and entrusted to unqualified technicians. Ethylene had slumped in popularity, though he regarded it as a very satisfactory anaesthetic within limits. He spoke of the very fine equipment at Madison, Wisconsin, and there also the tuition was very thorough. Students were put through a course of anaesthesia on animals before being allowed to deal with humans.

General Discussion

Dr. R. JARMAN commented upon the early start on the day's work which was the rule in America. Another feature which struck him was that 98 per cent. of the work in the States was paid for, and only 2 per cent. honorary, a striking contrast to the state of affairs in this country. He was impressed by the Lahey Clinic at Boston, but most of all by the clinic at Toledo. Chemical firms in America gave grants for the purpose of trying out various gases, a kind of thing which could not obtain in England. They knew that their drugs would not be accepted until backed by the signature of some university.

Dr. I. W. MAGILL said that in America no time was lost by the anaesthetist journeying from place to place with his cumbersome apparatus. Most of the work was done in hospitals, and the facilities offered for research were on a scale which could not be hoped for in this country for many years to come. At the Mayo Clinic the laboratories

were at the disposal of the anaesthetist for testing any drugs, and the note-taking was very elaborate. A stenographer was present at the operations and noted down the number of seconds taken for each stage and so forth. The value of the record thus obtained was beyond question. Dr. R. E. PLEASANCE referred to the excellence of the chloroform anaesthesia in the States, especially in connexion with gynaecological cases.

DISEASES OF THE COLON

A meeting of the West London Medico-Chirurgical Society was held at the West London Hospital on March 5, under the chairmanship of Mr. NEIL SINCLAIR, when a discussion took place on diseases of the colon.

Dr. A. F. HURST discussed the symptoms in organic disease of the colon, especially discomfort and pain; the situation which was most characteristic and diagnostic in this respect was the left iliac fossa. The next question to note was any change of the normal bowel habit, which always suggested disease of the intestines and more commonly of the colon. The speaker mentioned the great importance of rectal examination and examination of the stools. In his view there was no such thing as mucous colitis. The mere presence of mucus was not evidence of colitis; it was normally secreted in persons taking aperients, all of which acted as chemical irritants of the bowel. Mucus only indicated inflammation if it was present in a loose stool which was naturally produced and not the result of an aperient. Colitis began exactly like an ordinary dysentery. In this connexion a plea was voiced for the use of the proctoscope, an instrument which every general practitioner ought to use. Nearly all cases of carcinoma of the rectum and colon originated in polypi. Carcinoma of the colon might produce general ill-health with no local symptoms; the possibility of its occurrence should be considered in any person over 35 who complained of general unfitness and in whom a general examination had yielded no result. One other symptom in carcinoma of the colon which ought to be remembered was the presence of occult blood. Pain in the left iliac fossa was often due to diverticulitis. The vast majority of such cases could be treated medically; it was amazing how severe diverticulitis might yet respond to medical treatment comprising rest in bed, a non-residue diet, no aperient, increasing doses of belladonna, with 6 ounces of liquid paraffin given as an enema at night.

Professor GREY TURNER, discussing the subject from the surgical aspect, said that occasionally the inflammatory condition did not remain limited to the bowel, but there was localized peritonitis and a tendency to the development of internal fistulae. He thought that there was a tendency in a case of fistula between the colon and bladder to attempt too much at one time; if anything had been learnt during the last ten or fifteen years it was the extreme importance of dealing with such fistulae in stages. When there was a communication between the large bowel and the bladder it was enough to advise preliminary colotomy in the first instance and only to attempt at a second intervention the more extensive operation which might be necessary. Diverticula did not appear to have any ancestral relation to malignant disease, though the two conditions occurred in the same types of persons and at about the same period in life. Dr. H. W. POST showed a large number of radiographs and discussed the two principal means of examining a patient—namely, by giving a barium meal which indicated the physiological condition of the large bowel, and by giving a barium enema which revealed the anatomical appearance and any pathological changes present. It was very rarely that by means of an *x*-ray examination carcinoma of the rectum could be diagnosed. Mr. CECIL WAKELEY said that the majority of carcinomas of the caecum were not diagnosed until there was a very large tumour; they did not give rise to obstruction until an enormous growth overlapped the ileocaecal valve. On exposing such a tumour it might be deemed to be inoperable, and a palliative ileocolostomy be undertaken. But later it would be found that the fixity had disappeared, such fixity being not due to the growth but to the superadded sepsis. When the irritation disappeared after the colostomy the growth became more mobile. One of the most important things which had become clear was that in carcinoma of the colon multiple operations had to be performed.

Dr. MAURICE SHAW mentioned the condition known as spastic or hypotonic colon, and its treatment by large doses of belladonna. The other principle in the treatment of spastic colon was to recognize that its causes were often psychogenic; treatment must be largely a question of routine. He had watched the treatment of colitis for some fifteen years; no very significant advance seemed to have been made apart from dietetic treatment. The most important point was to encourage the patients to take as full a diet as they could. There was some possibility of doing good by protein shock, though Dr. Shaw had found none in serum therapy. Mr. G. F. G. BATCHELOR referred to the question of performing colectomy in the presence of secondary growths in the liver and cited a case in which such secondary growths in the liver were well marked clinically and at the operation. He had performed colectomy, however, and for two years the patient had been quite comfortable. When the patient returned the secondary growths were in the pouch of Douglas and the liver was not enlarged. Dr. GEOFFREY KONSTAM said that he was always hesitant about diagnosing spastic colon; nowadays with all these accessory methods it was desirable to have some sort of confirmation. With regard to the use of belladonna he pointed out that if this treatment were pushed to the extent which Dr. Shaw had suggested it would prevent reading by paralysing accommodation; the patient would not be able to speak because of the dryness of his mouth, nor to eat because of the drying up of the secretions of his stomach.

ALKALOIDS OF ERGOT

At the annual general meeting of the Society of Public Analysts Dr. G. ROCHE LYNCH was elected president for the year 1937, and on the invitation of the council Professor G. BARGER, D.S., F.R.S., gave an address on the alkaloids of ergot.

Professor Barger said that at least eight alkaloids had been obtained from ergot, a parasitic fungus growing on rye and other grasses. These somewhat unusual bases, from a somewhat unusual source, comprised four pairs of interconvertible isomerides; in each pair one isomeride was laevorotatory, had a powerful pharmacological action, and a great tendency to crystallize in molecular combination with organic solvents; the other isomeride had a high dextrorotation, had little pharmacological action, and crystallized without solvent. All the alkaloids were hydrolysed to lysergic acid—$C_{16}H_{16}O_2N_2$—an indole derivative capable of isomerization; the two forms of lysergic acid corresponded to the two series of alkaloids. In addition to this acid ergometrine (the most important therapeutic principle of ergot) and its isomeride ergometrinine yielded on hydrolysis merely hydroxy-iso-propylamine; the other alkaloids each gave instead of the amine a series of products: ammonia, a keto-acid, and two amino-acids; these more complex alkaloids were akin to peptides. Thus ergotinine, $C_{35}H_{39}O_5N_5$, furnished lysergic acid, ammonia, isobutyrylformic acid, phenylalanine, and proline. The pharmacological and toxic actions of ergotoxine, ergotamine, and ergoclavine were very similar and highly characteristic. In the case of all the alkaloids the molecular formula had been established with certainty by analysis and by hydrolysis.

The various chemical and physical methods for the alkaloidal assay of ergot were discussed, and finally an account was given of the two forms of the epidemic disease ergotism, the gangrenous and the convulsive type, which raged in former centuries.

FIBROCYSTIC DISEASE OF BONE

At a meeting of the Devon and Exeter Medico-Chirurgical Society, held at the Royal Devon and Exeter Hospital on February 25, with the president, Dr. R. H. NORMAN, in the chair, a paper by Mr. R. WAYLAND SMITH, in association with Dr. H. F. L. HUGO, contained the notes of a case in which fracture of the neck of the right femur was associated with fibrocystic disease.

The patient, shown to the meeting, was a woman aged 70 who had sustained the injury by slipping on her doorstep on October 14, 1936. Radiographic investigation revealed a fracture without much displacement, and showed in addition deformity of the upper third of the femur from fibrocystic disease, extending from the head of the bone to beyond the great trochanter. A pinning operation being considered impracticable, the limb was put up in plaster-of-Paris, but the latter had to be removed after a week owing to a skin complication. Resort was then had to extension and sandbags, the outlook for ultimate union seeming to be poor. Nevertheless the fracture healed, and she was able to get about on two sticks, a calliper still being worn.

Radiographs were shown to demonstrate the condition as seen a few days after fracture and also observed quite recently. Not only was there every appearance of firm union in good position, but there was obliteration of the cystic disease to a great extent in the area affected by the fracture. Mr. Wayland Smith explained that in these cases union was aided by the periosteal reaction set up around the cystic disease, and thus in these two separate conditions (fracture and fibrocystic disease) reciprocal benefit had been the end-result of their association.

Diagnosis of Paratyphoid B Infection

Dr. J. C. FULLER read a short paper on two cases of pyrexia which had been recently in his care, and in which the course of the febrile symptoms had been somewhat similar. Eventually a diagnosis of paratyphoid B infection had been established in each instance.

CASE I

A young unmarried woman had complained on November 26, 1936, of a sudden attack of headache, shivering, and aching of the limbs. On the following day the symptoms increased and there was difficulty in taking a deep breath. On admission to hospital on November 29 the temperature had been 102.2°, the respirations 44, and the pulse rate 144. Grunting expiration was present, and physical signs of consolidation were noted at the base of the left lung posteriorly. There was no evidence of any cardiac complication, and no enlargement of the spleen or other abdominal abnormality could be detected. There was no sign of any joint disturbance. A diagnosis of pneumonia was made and treatment appropriate to this condition was begun, including injections of a mixed pneumococcal immunogen (antigen). On the fourth day after admission—apparently the eighth day of the disease—the temperature fell by crisis with coincident reduction in the respiration and pulse rates. A total white cell blood count on the day of admission had been 7,100; on December 1 it was found to be 13,400. Up to the time of the crisis the bowels had been irregular, two actions on two days and no action on another. For the next five days her condition had seemed to indicate a satisfactory convalescence, except that the signs of resolution in the pneumonic lung were absent. However, on the evening of December 9 the temperature shot up to 102.8°, remained at that point on the morning of the 10th, and reached 105.4° on the evening of that day. On the 18th the readings were 102° and 104.4° in the morning and evening respectively. The pulse rate ranged from 100 to 130 in this second febrile period; she was listless with low-muttering delirium. There was some rigidity of the neck and a considerable degree of deafness. She was now coughing up blood-stained sputum, but radiological examination showed no abnormality beyond a greying of the left middle and lower zone proportionate to the physical signs. The blood count on December 17 showed a fall in the leucocytes to 6,800, the differential count being non-indicative. The cerebro-spinal fluid was found to be normal in every respect, and a blood culture proved sterile. The stools, however, were relaxed, and in view of this and the white cell count a Widal test was made on December 22, when agglutination was obtained up to a dilution of 1 in 500 to *B. paratyphosus* B. This organism was also recovered from the stools. Eventually the patient made a slow but complete recovery—the temperature falling by lysis—and she was discharged from the hospital on February 11, 1937, after three negative findings in the stools.

CASE II

A girl aged 9 was an inmate of a children's home, and ten days before her admission to the Exeter City Hospital the matron reported that she had had a typical attack of influenza, forty other children being similarly affected at the same period. She appeared to make a rapid recovery, but a few days subsequently she was noted to be listless and her temperature was found to be high. On admission to the hospital the temperature was 105° and the pulse rate 136. Hyperpyrexia continued for four days and then fell by crisis, pneumonic signs appearing at the left base. For nearly a week following the crisis the temperature remained normal and then rose suddenly to 102°; there was complaint of abdominal pain, and she vomited on several occasions. When seen by Dr. Fuller on January 14 the temperature was 102° and she was pale and listless; no rash was present. Examination of the chest revealed a patch of consolidation at the angle of the left scapula, and crepitations were heard at both bases. There was definite leucopenia (3,400), and the Widal reaction was positive up to 1 in 125 to *B. paratyphosus* B. The child was transferred to the City Isolation Hospital, and a few days later was found to have a typical rash. The subsequent progress of the case offered no particular points of interest, except that the fever was somewhat protracted.

Local News

INDIA

Progress in Public Health

The annual report of the Public Health Commissioner with the Government of India for 1934, which has been recently issued, surveys the state of public health in British India and some of the native States. The death rate was higher than in 1933, also the infantile mortality rate, while the birth rate was lower, but such fluctuations are a normal characteristic of the annual statistics of the country. Although there is evidence of widespread undernutrition in India, there is no evidence of the poorer classes being worse fed than hitherto. There is, however, a great need of a comprehensive survey of food production in the country as a whole. Until such a survey has been carried out the question of food supply in relation to the population, should the latter continue to increase as it did between 1921 and 1931, cannot be satisfactorily determined.

PRINCIPAL CAUSES OF DEATHS

Of the total number of deaths during the year 58 per cent. were attributable to the "fevers" group of diseases. Violent epidemics of cholera are becoming less frequent, a fact explained by the development of the public health services and the extension of the prophylactic use of cholera vaccine, but there is as yet no clear evidence of a significant fall in the mortality rate in this disease. This may be due in some measure to the general improvement in statistical registration leading to the recognition of hitherto overlooked centres of disease and thus offsetting the obviously beneficial results of preventive work. There was increased plague incidence and mortality, but the disease was for the most part confined to the provinces of Northern India. The female death rate from this cause was higher than the male, but comparative freedom from the disease was reported from the whole eastern seaboard, Northern Burma, Assam, Bengal, the south-

eastern parts of Bihar, the western areas of the Punjab, and Upper Sind. Small-pox was only moderately prevalent, but an extension of compulsory vaccination to rural as well as urban areas is still needed, and a wider practice of revaccination at school age. The degree and duration of immunity conferred by infant vaccination against small-pox was investigated at the Belgaum Vaccine Institute and found to be much shorter than was previously believed; it may be taken as four years in one-fifth of the children and seven years in one-half. Deaths from "fevers" totalled nearly four millions in 1934, as compared with three and a half millions in the preceding year, rural rates exceeding the urban in all provinces. Malaria mortality was fairly high, and the debilitating effects of this infection were partly responsible for the exceedingly high mortality figures for influenza, pneumonia, and dysentery. It is estimated that there must have been over 110 million cases of malaria in 1934, and it has previously been computed in other quarters that such a figure is approximately correct. There are probably about two million cases of tuberculosis in India, a great number of these being found in Bengal, Madras, the Punjab, and Bihar and Orissa. An increase in the future is feared since it is thought that there are many villages which have not as yet been exposed to infection, and which consequently will afford a virgin soil for the disease. Leprosy is more common in India than was formerly supposed, and probably a million cases exist. The disease is especially prevalent among semi-aboriginals or aboriginals who have left their tribal seclusion and hired themselves out to agriculturalists and industrial concerns. A network of clinics has been established in endemic areas, and early cases are coming forward in increasing numbers. Leper colonies are overcrowded, and special centres are being established for "burnt-out" cases to lessen the congestion.

MATERNITY AND CHILD WELFARE

A review in 1934 of the maternity and child welfare situation revealed an insufficiency of well-qualified medical practitioners and health visitors. There were five training schools in that year for health visitors; of the major provinces Bengal and the United Provinces alone had no course of training, but in the latter a scheme was ready to be launched. An appeal is voiced in the report for the appointment of a special assistant director for maternity and child welfare in each province and the establishment of a central official controlling body to advise on and to direct policy. Regret is expressed that the importance of sound environmental hygiene is very inadequately recognized, and that this makes it very difficult to secure financial support for urgently needed reforms. It is not infrequent to find that large sums are spent on roads or hospitals in large towns before a safe water supply has been provided. Town cleansing is too often carried out at night, with poor results except in the larger towns, which are well lighted by electricity. Nevertheless, Lieut.-Colonel G. G. Jolly, I.M.S., officiating Public Health Commissioner with the Government of India, concludes his report with the statement that the "sanitary idea" is beginning to penetrate the mind of India. Interest is increasing in rural reconstruction, nutrition, child welfare, and the prevention of epidemics. He thinks that the time is ripe for a great step forwards.

The Mission to Lepers

Mr. Wellesley Bailey, who founded in 1874 the Mission to Lepers, died in Edinburgh on January 29 at the age of 90. Born at Thornbury, Abbeyleix, Queen's County, Ireland, he went out to India when 22 years old, with the intention of joining the Indian police, but he stayed for some time with a missionary friend, and consequently became attached to the American Presbyterian Mission as head master of the mission school in Ambala. There was a small colony of lepers near the school, and Mr. Bailey visited it regularly. In 1874, when he returned home on his first furlough, he delivered an address at the Friends Meeting-house at Monkstown, Co. Dublin, on the sad plight of the lepers, which aroused so much sympathy and interest that the Mission to Lepers was brought into being. Twelve years later he returned to Great Britain as general secretary of the mission, and for more than thirty years held that appointment, with his office in Edinburgh. When he retired in 1917 he was appointed honorary superintendent of the mission, and participated in its diamond jubilee celebration in 1934. The mission is now caring for some 15,000 lepers and their children in its own and in aided institutions in various parts of the world, the whole organization having evolved from an original small asylum in the Punjab.

FRANCE

[FROM OUR CORRESPONDENT IN PARIS]

Hospital Services for All

At the last general meeting of the Confédération des Syndicats Médicaux de France diametrically opposite views were expressed regarding the development of the general public hospital for all classes of the community. Only a generation ago the hospitality of the public hospitals was such that, as a rule, you had to be very poor to want to accept it. As the quality of this hospitality has improved the social and financial status of the applicants for it has risen, and now it is becoming more and more tempting for the medical officers of public hospitals to favour their development for middle-class more or less well-to-do patients. Dr. Rénon of Niort has made such a success of the omnibus hospital that his advocacy of it made a great impression at the meeting. It would seem that at Niort everyone is satisfied; the doctors co-operate, and the citizens of all classes enjoy the benefits of hospital treatment like so many shorn lambs for whom a kindly Providence has provided modern air conditioning. This idyll would, however, seem to be the exception rather than the rule, and Dr. Guillaume of Chaumont painted quite another picture. If it is the truer one of the two the development of paying departments in public hospitals is a veritable menace to the general practitioner throughout the country. It is difficult to escape the conviction that here, as in so many other problems, personalities count more than principles.

Poliomyelitis in Paris

Professor L. Tanon and Dr. A. Besson have recently undertaken a statistical survey of the incidence of poliomyelitis in Paris in 1933, 1934, and 1935. The number of cases in these three years was fifty-six, forty-three, and seventy-two respectively. The deaths in the same three years were seventeen, twenty-two, and nineteen respectively. Only one arrondissement escaped; all the others suffered more or less equally, the disease being evenly distributed irrespective of social strata in the community. A peak in December, 1934, and January, 1935, was contrary to the conception of poliomyelitis as an eminently late summer and early autumn disease. On the whole there were more cases among females than among males, the female predominance in this respect being greatest in childhood. Professor Tanon and Dr. Besson stress the importance of the healthy "carrier" and of the abortive forms of the disease which are, in their opinion, most numerous. With poliomyelitis sporadically endemic in Paris and with the healthy "carrier" largely responsible for its spread, they are sceptical of the value of disinfection measures on the death of a patient or on his removal to new quarters. Whatever the nature of the infecting germ it would seem not to be viable for long out of contact with living beings, and fumigation and suchlike sanitary gestures are probably of moral rather than material value.

ENGLAND AND WALES

Education in Better Feeding

The Gas Light and Coke Company gave a reception at its headquarters in Westminster on March 11, when the nutrition film which this company recently produced was projected and a new venture of the company with a similar objective was explained by Sir David Milne-Watson, the governor. The film is designed to bring out the significance of Sir John Orr's declaration that in a very large number of families not more than four shillings a week per head is spent on food. Sir David Milne-Watson explained that inasmuch as over 90 per cent. of the cooking in its area is done by gas, his company is closely concerned with the choice, treatment, and use of food, and therefore it is intended to follow up the nutrition film as a contribution to the cause of better feeding by an educational campaign. In half a dozen of its showrooms in working-class areas of London a series of special lecture-demonstrations are to be given under the general heading of "Better Meals for the Money." These lecture-demonstrations will show how, in the opinion of experts on diet questions, the sum of 4s. 6d. per head per week can be laid out to the best advantage in the selection and purchase of food. A leaflet has been prepared giving a week's menus—breakfast, dinner, and tea—for a family of five. The ingredients of these meals have actually been purchased in the areas where the lecture-demonstrations are being given for 22s. 6d. in all. Particulars are given of the time needed in preparation and the cost of the fuel for cooking each meal. Sir David Milne-Watson pointed out that his company must not be taken as expressing any opinion as to the adequacy or otherwise of 4s. 6d. per head, but in view of the fact that large numbers of people have no more than this to spend it seemed desirable to set out how they might spend it with wisdom. He added that the existing menu sheet was based on food obtainable at the present season, and that in due course others would be prepared appropriate to the time of year. The lecture-demonstrations would be made attractive by including a demonstration of the cooking of one or more of the listed meals, and they would explain in simple terms the significance of recent discoveries about diet and the need for the right proportions of different types of foods, particularly protective foods. Professor V. H. Mottram said that the meals represented, so far as the money would go, one of the most sensible ways of laying out the weekly budget, including as much of the right proportions of body-building foods, energy foods, and protective foods as possible. The film, for which Mr. Julian Huxley is commentator, is a very interesting and ingenious production.

Willesden Maternity Hospital

The clinical report of the Willesden Maternity Hospital, published under the auspices of the Willesden Borough Council, is based on a survey of the first 3,000 cases attended at this institution. The majority of these, numbering 2,939, were booked cases, showing a maternal mortality of 1.02 per 1,000. Sixty-one emergencies show a mortality of 65.57 per 1,000, while the rate for all cases is 2.33. In a covering memorandum accompanying this report the medical officer of health describes the methods employed in Willesden with a view to reducing preventable death or disablement consequent upon child-bearing. With the opening of the maternity hospital in 1931 arrangements were made for ante-natal care of the mothers at health centres under the supervision of the council's consultant obstetrician. In this connexion special attention has been paid to the importance of health visiting. Post-natal care is also provided under similar conditions. The memorandum stresses the importance of adequate feeding for expectant and nursing mothers. It is suggested that this aspect of the problem has received insufficient attention, and that it is desirable that mothers should receive meals under an arrangement comparable to the scheme applicable to school children. It is also suggested that greater attention should be paid to the newborn infant, and that a skilled paediatrician should be attached to the hospital for this purpose. The memorandum envisages a future consideration of means to provide a further period of rest and recuperation following confinement. Despite the extension of the hospital in February, 1935, accommodation is still inadequate, and for this reason 356 cases were refused admission between that date and October 31st, 1936.

L.C.C. Committees: Medical Members

The committees of the newly elected London County Council were settled on March 16, and the distribution among them of the medical members is shown as follows: Education, Dr. J. A. Gillison; Entertainments, Dr. Bernard Homa; Establishment, Dr. Homa and Miss Esther Rickards, F.R.C.S.; Finance, Dr. S. W. Jeger; General Purposes, Dr. F. Barrie Lambert; Hospitals and Medical Services, Dr. C. W. Brook, Dr. S. Monckton Copeman, Mr. Somerville Hastings, Dr. Jeger, Miss Rickards, with Dr. H. Winch (co-opted); Mental Hospitals, Dr. Lambert, with Dr. Doris Odlum (co-opted); Parks, Dr. Lambert; Parliamentary, Dr. Jeger; Public Control, Dr. Jeger; Supplies, Dr. Lambert; Town Planning, Dr. Gillison; Welfare of Blind, Dr. Brook. It will be seen that the medical members of the new Council are shouldering a full share of the committee work, which is by far the most important part of the Council's activities; the only notable omission is the entire absence of medical representation on the Housing and Public Health Committee.

SCOTLAND

Crichton Royal Institution

The annual report of Crichton Royal Institution, Dumfries, by Dr. C. C. Easterbrook, physician-superintendent, shows that the number of patients treated during 1936 was 1,231, and the number resident at the close of the year was 978, of whom 626 were private patients and 352 rate-aided patients. During the year there were 258 admissions, 176 discharges, and 77 deaths. Voluntary patients under treatment in 1936 numbered 424, of whom none required to be certified, and of the 180 private patients admitted 70 per cent. came voluntarily. The service patients maintained by the Ministry of Pensions as private patients numbered ten. Of the special stresses activating mental illness among the admissions biologic stresses comprising the critical periods of life were present in 60 per cent.; strain of child-bearing 1 per cent. only; psychic stresses, including worry, affliction, and mental privations such as solitary life and want of occupation, 40 per cent.; toxic stresses such as alcoholic excess, 17.4 per cent. of men and 2.4 per cent. of women; physical shock 7 per cent.; and pathological stress of bodily disease 4 per cent. The types of mental illness among the admissions were: constitutional psychoses of melancholia, dementia, mania, etc., 87.3 per cent.; psychoneuroses 3.8 per cent.; organic psychoses 3.8 per cent.; and congenital psychoses 5.1 per cent. At the time of admission the mental illness had lasted for less than half a year in 56 per cent., under two years in 19 per cent., and above two years in 25 per cent. Of the discharges 106 were voluntary and seventy certificated, and the recovery rate was 34.5 per cent., with 35.9 per cent. improved, among the voluntary patients, and 42.2 per cent., with 14.6 per cent. improved, among the certificated ones. The general recovery rate of all cases was 37.9 per cent., with 26.3 per cent. improved, while the total duration of the disorder in those who recovered was less than half a year in 39 per cent. and less than two years in a further 38 per cent. The causes of death included fatty

degeneration of the heart, apoplexy, senile decay, and pulmonary diseases, the mean age at death being 62.4 years.

Princess Margaret Rose Hospital

At the half-yearly meeting of the Princess Margaret Rose Hospital for Crippled Children at Fairmilehead, Edinburgh, on March 2, the Earl of Home presiding, the remarkable development of this hospital since its opening less than five years ago was described. The hospital then consisted of one ward for twenty-five patients; it now had four wards with accommodation for 100 children and a capacious massage department was under construction. A system of clinics with an outdoor staff was being developed in the south-eastern region of Scotland, and energetic attempts were being made to obtain clinics in those areas which did not yet possess them. The Edinburgh area had at present ten cases in the hospital, Fife and Clackmannan thirty-two, East Lothian four, Midlothian four, Roxburgh four, and Berwick three, while private patients numbered fourteen. The reason that there was a waiting list of eighty when there were empty beds in the hospital was because of the quota system, by which individual counties made definite financial grants for the orthopaedic services to patients from their areas. The result was that a county which had thirty patients requiring treatment might only send five to the hospital at one time, the other twenty-five waiting their turn, and it was only by additional allocations by the local authorities concerned that the number of patients paid for by them could be increased. There were at present seventy-three such patients in the hospital. A large number of out-patients were seen regularly at clinics in the county areas, and as a result many incipient cases of crippling illness could be cured at an early stage and hospital treatment avoided. The report showed that the financial position of the hospital had been improving, and that it had been possible within the last few months to pay off a loan of £3,000 which had been granted by the Scottish branch of the Red Cross Society. Legacies and special donations during the past ten months had amounted to £5,087, and the sum received in patients' fees during this period had been £6,797. Against this the running expenses had amounted to £8,538. The report of the surgeon, Mr. W. A. Cochrane, showed that from July, 1936, to January, 1937, 123 patients had been admitted as compared with seventy-one in the previous six months, and the patients discharged had numbered 108 as against sixty-six.

Perth Royal Infirmary

The income of the Perth Royal Infirmary for the past year was £17,438 and expenditure was £24,454. The Infirmary has received a bequest of £20,000 under the will of the late Miss Chalmers of Ashburton, New Zealand, the last of a family which left Perthshire many years ago for New Zealand. Many necessary improvements have been made since the Infirmary was opened in 1914, and as these have been met by expenditure of capital, the income from invested capital has decreased at the same time as running costs have increased. The directors have decided to erect a new out-patient department, and an appeal is therefore being made to the public to fill up the deficiency in the hospital's funds.

Psychiatric Wards in General Hospitals

At a recent meeting of the Scottish Association for Mental Welfare Dr. William Harrowes, medical director of New Saughtonhall Mental Hospital, Edinburgh, gave a lecture on "Inadequate Health," at which Dr. W. G. Sym presided. Dr. Harrowes said that mental hygiene could be divided into two main branches, of which one was concerned with society as a whole while the other was devoted to individual problems. A new outlook was the gradual recognition of the great extent to which health could be modified by emotional disturbances that were not temporary but semi-permanent, chronic, and unconscious. Faulty function of internal organs might readily influence the thinking functions, but on the other hand faulty thinking might result in physical malfunction. This principle was contained in the phrase concerning the influence of mind over matter, but the medical profession as well as the community in general had been slow to grasp its implications. Much interest was aroused about two years ago when Dr. Halliday of Glasgow showed that about one-third of all the patients sent to a medical referee under the national health insurance scheme were suffering from physical malfunctions due to faulty mental hygiene and not to any organic physical disease. It was not sufficiently recognized that almost any symptom might be produced by inadequate mental health. As a result many patients wearied of an honest physician who told them that there was nothing wrong (which was in a sense true), and went to unorthodox advisers who told them that there was something very far wrong which could be put right. Very often headaches, indigestion, weak hearts, rheumatism, and constipation were matters of psychology, and it should be recognized that insufficient health was in a high percentage of cases a matter of poor adjustment and poor mental hygiene. Dr. Harrowes suggested that, to overcome this, psychiatric wards should be established in association with general hospitals, and children's hospitals should have a department for the maladjusted.

Correspondence

A Civilian Ambulance Service

SIR,—While the Home Office and local authorities debate and mature their plans for the protection of the civilian population in the event of war and aerial attack, while doctors and policemen are given instruction in anti-gas measures, and moneys are voted for the expansion of fire brigades, we seem to hear comparatively little discussion of arrangements for the collection, sorting, evacuation, and treatment of the numerous civilian casualties which must, we know, be visualized as occurring in spite of all these measures.

The lessons of the last war and of Madrid, with their small-scale raids, have at least given us some measure of what we may some day have to anticipate, and we have reason to believe that gas and incendiary bombs may now be added to high explosive. One or two large-scale raids might easily fill all the hospitals of a city to overflowing. City hospitals themselves might not escape damage. It is evident that, in addition to aid-posts and clearing stations, large fleets of ambulances would be needed, and that a circle of schools and other suitable buildings well beyond the outskirts of exposed towns would have to be equipped as hospitals to receive the casualties.

There are many medical men in this country who will be unwilling, for conscientious reasons, to serve with the armed forces in any future war. There are also thousands of men of military age who will refuse to fight or make munitions. Remembering the fine service given by the Friends Ambulance Units and the British Red Cross Society during the last war on behalf of sick and injured civilians, should we not be turning our thoughts to the provision of an adequate medical service for our own civilian population in the event of the attack which we hope will never come? Such a service would incidentally provide urgent and essential humanitarian tasks for numerous volunteers who might be unable or unwilling to serve with the armed forces in any way. For London alone an efficient organization would require an army of able-bodied ambulance drivers, stretcher-bearers, and orderlies.

There would be no lack of doctors and nurses with experience, both clinical and administrative, gained in the

last war, and it should be possible for these, in co-operation with the Quakers, the Red Cross, and the St. John Ambulance, and with or without the help of the Government or the municipalities, to organize an efficient scheme. Such a scheme would be in the national interest. At the same time it is not inconsistent with pacific endeavour to envisage alternative forms of humane assistance in the event of war. While making provision for stricken men, women, and children, such an organization would help to disarm bitterness and avert a vast amount of unhappiness in connexion with conscientious refusal to give military service.—I am, etc.,

Cambridge, March 11. JOHN A. RYLE.

Zinc Protamine Insulin

SIR,—I would like to remove a misapprehension that may arise in some minds from your leader on the above subject. It is stated that "Lawrence and Archer suggest that small doses of zinc protamine insulin come into action more rapidly than large doses." We do not think that any part of our article suggests this, but if it does it is our error. When any difference in initial speed of action can be detected the larger doses are prompter.

But, more important, it is clear from all the articles on zinc protamine insulin that large single doses of 30 to 50 units are being used, and that many patients have to inject more than 1 c.cm. of the compound, as the only strength at present issued is 40 units per c.cm. This is uncomfortable and bad for the tissues, and I think it essential that a stronger preparation, 80 units per c.cm., be marketed. I hope that publicity in your columns will hasten this.—I am, etc.,

London, W.1, March 15. R. D. LAWRENCE.

SIR,—In his article on protamine and zinc protamine insulin in your issue of March 13 (p. 542) Dr. H. P. Himsworth makes a declaration which is very difficult to understand. He says: "It is regrettable that a knowledge of the blood-sugar level should still enjoy the greatest vogue as the guide to treatment. . . . The finding of glycosuria indicates loss of food in the urine, the testing of specimens passed at different times in the day shows when this waste occurs and points the way to the necessary modification in treatment." Naturally, if one is going to allow one's diabetic patients to pass sugar the urine is a very convenient way of following up and rectifying their excessively bad periods. What is the position, however, in the case of those patients who have a high sugar leak-point? Such patients are very common indeed, especially when their diabetes has been established for any period before they come under treatment. Are they to be allowed to run high blood sugars throughout the day as long as they remain free from ketosis and glycosuria?

The aim in the treatment of diabetes would seem to be to keep the patient well, but in between meals to keep the blood sugar running as nearly as possible in the normal level. The idea of this is clearly to rest what remains of the actively functioning portion of pancreatic tissue, and it seems to me that mere urine testing is far too crude a method to adopt if one hopes to achieve the end which I personally have in view. I would rather put Dr. Himsworth's statement the other way round and say that the relatively crude method of urinary sugar examinations is a sufficient guide to the early stabilization and treatment, but that after this it is essential to do adequate blood-sugar estimations if one wishes to treat one's patient reasonably decently. While it is true that the patient's physical condition is the most important factor, and that one ought not to be a slave to blood-sugar estimations in the face of clinical evidence, it is also true that these give the earliest indications of faulty treatment or change in the insulin dosage required by the patient, and I am afraid that I shall not be persuaded to change my method of controlling my patients by Dr. Himsworth's argument. I consider the urine method of control too crude for *ultimate* optimum results.

As regards zinc protamine insulin, the great difficulty I foresee is the safe standardization of patients. The most undesirable time for insulin to have uncontrolled and unobserved action is during sleep at night, and even though someone else sleeps with them, as has been suggested, it would appear necessary for the other sleeper to be awake: not a very practical proposition. The greater difficulty would be in the case of those diabetics who suddenly improve and require rapid reduction of their insulin. I foresee trouble in such cases with the insidious and often severe and not easily controllable hypoglycaemia which is reported to occur with these delayed-action insulins. Doubtless this will be overcome. The end could be achieved by a good carbohydrate meal at bed-time, but surely if the last meal of the day is properly regulated the night blood sugar will look after itself without the help of delayed-action insulin.

Protamine insulin is probably a safer preparation for routine use than is the zinc modification. If the former is given as a morning injection its action is exhausted during the waking hours, and there is no risk of a progressive night hypoglycaemia; it could be assisted by necessary amounts of soluble insulin as required. Is the zinc protamine insulin therefore a real practical advance on the original protamine product and, if used much, will it not lead to excessive amounts of carbohydrate being supplied at night as a safety-valve? In the latter case it defeats its own end, and the diabetic may end with a higher night blood sugar than if he were treated by the older methods!—I am, etc.,

London, S.E.5, March 12. GUY BOUSFIELD, M.D.

Meningococcus Antitoxin

SIR,—May I venture to thank you for the kind remarks in the *Journal* of February 27, and add one further point to the letter that you were good enough to publish in your issue of February 20? As there described, the anti-meningococcus serum that proved successful clinically was standardized by employing the peritoneal route in mice. At the suggestion of the late Captain S. R. Douglas, F.R.S., I tried the cerebral route for this purpose, but without success. Although the meningococcus endotoxin was inactivated by the clinically potent serum when injected intraperitoneally, the mice that received the same mixture *cerebrally* all succumbed. The cerebral route in short appeared to be too severe a test of neutralization in case of this powerful endotoxin.—I am, etc.,

St. Bartholomew's Hospital, March 14. M. H. GORDON.

Continuous Intravenous Saline Infusion

SIR,—Our thanks are due to Mr. Hamilton Bailey and his associates for their article on continuous intravenous saline in the *British Medical Journal* of March 13 (p. 552). This timely description places the procedure on a firm basis. For lack of it many a good innovation spreads in a slow haphazard fashion, and is apt to suffer from misapplication. Extensive use in the past four years prompts a few further remarks on what is likely to be taken up widely by the profession.

1. In regard to indications: (*a*) In major traumatic surgery, where haemorrhage and shock combine to devitalize the patient, it has proved highly beneficial. Thus, a heavy woman aged 44, who fell under a train in 1935, healed after a pulped left arm and leg were amputated close to the trunk, and is well to-day, thanks to it. The same is true of a young woman with multiple compound wounds, including a shattered ilium. In exsanguinated states due to ruptured solid viscera or ectopic gestation it sustains the vital organs. Most of these cases also require and have received blood transfusion.

(*b*) Where septic peritonitis and paralytic ileus complicate abdominal catastrophes rest is essential for the inflamed bowel. This group merits separate recognition, for it is one of the commonest treated by intravenous saline. Even if at the early stages vomiting is not present it will ensue if the stomach does its duty and rejects all ingesta. Meanwhile the need for fluid in other vital and unrestable organs continues and is often imperfectly supplied by large bowel saline feeding. A woman of 78 years was seen recently with hypogastric peritonitis due to gangrenous diverticulitis, and colostomy was an inevitable part of the operation. The rectal and appendicular routes for saline administration were inapplicable. In this case, and several others of the same gravity, the patient has recovered.

2. In regard to dangers: There is the need for assuring oneself that nurses, both day and night, fully comprehend the significance of the procedure. This has been deeply impressed upon me, as have the demands on time that it involves. Experience will reveal many minor pitfalls. The major risk, that needs underlining in red, is sepsis. One patient of mine died rapidly from septic phlebitis of the arm and multiple lung abscesses, and I know of at least one other such case proved by necropsy. Therefore the indication for its use must be adequate and the following precautions practised as far as possible. Instead of inserting a cannula by open operation, venous puncture by needle should be aimed at, and signs of redness, pain, and tenderness along the vein or temperature warnings must be heeded. Further, I doubt the wisdom, or even the need in most cases, for giving six pints in the twenty-four hours—that is, approaching the maximum short of oedema of the tissues. I now give the twenty-four-hours' supply of two or three pints of 5 per cent. glucose saline by day only to spare the patient the unsettling effect at night, and I reinsert the needle for subsequent administration as required. The veins and the circulation will tolerate this moderate violation of natural nutrition and it seems to give the required hydration, while, what is most important, rigors and appreciable local reaction are avoided, so that its use may be prolonged over a week or more.

—I am, etc.,

Bristol, March 14. A. WILFRID ADAMS.

SIR,—An article in the *Journal* of March 13 (p. 552) entitled "Continuous Intravenous Saline Infusion" contains a number of statements which require comment. First, in the paragraph headed "Indications," intravenous saline therapy is recommended for "dehydration from any cause, such as starvation, vomiting, diarrhoea, or excessive sweating." Now it is quite reasonable to give sodium chloride to patients who can be shown to be suffering from a chloride deficiency, but surely not otherwise. And why into a vein?

Intravenous saline is also recommended for the treatment of anuria; rather the opposite of dehydration, one would think. Now physiologists have shown that intravenous saline causes a diuresis, which might be desirable in cases of anuria. But how, then, can it possibly benefit an already dehydrated patient if he is going to suffer a diuresis? Rectal or oral saline is capable of restoring the body fluids much more effectively. As a matter of fact, intravenous saline does work in certain cases, having a transient effect in raising the blood volume, but it is surely a grave mistake to describe "normal saline" as being "manifestly physiological." It may come as a surprise to the authors to learn that the normal plasma chlorides are about 0.585 per cent. expressed as sodium chloride. The 0.9 per cent. so-called physiological saline is therefore obviously too strong and will produce a diuresis, and in those cases where the kidney function is slightly depressed, so that the chloride concentrating power of the kidney is deficient, a net loss of fluid may be sustained in the effort to rid the body of the excess of chloride.

In "Conclusion" the authors refer to the advantage of intravenous medication in that "the rate of flow and the amount of fluid given can be regulated with mathematical precision." If the authors were capable of determining exactly how much fluid were required this would indeed be an advantage, especially if they used 0.585 per cent. instead of "normal" saline. But I submit that the patient's body knows better, and the ordinary routes for fluid—mouth and rectum—give it an opportunity to absorb just as much as it requires. Finally, they state that the choice of methods for estimating when the patient has received enough fluid lies between an estimation of the plasma protein and the rough-and-ready method of comparing intake and output. I fail to understand how an estimation of the plasma protein can possibly be taken as an indication that the patient has or has not received sufficient fluid.

As I am placed in the list of references, I should like to repeat some of my own conclusions. "The best method of fluid replacement if the oral route is contraindicated is per rectum, preferably by continuous drip." "Since pulmonary oedema may result from abnormally low percentage of protein in the plasma, and since intravenous fluids tend to lower this percentage, the level of the plasma protein should be ascertained before giving fluid intravenously."

The blind pumping into a vein of fluids without previous knowledge of the exact deficiency is to be condemned. In my opinion intravenous saline should never be used unless the oral or rectal routes are absolutely contraindicated.—I am, etc.,

W. W. WALTHER.

Department of Pathology, Queen Mary's Hospital for the East End, March 13.

Nasopharyngeal Sepsis in Cases of Mental Disorder

SIR,—I was greatly interested by Dr. T. C. Graves's article in the *Journal* of March 6 (p. 483). The account of nine years' unremitting pioneer work in this type of investigation reflects the greatest credit upon the author and his staff, and can leave no doubt in the mind of the reader that nasopharyngeal sepsis is often present in those suffering from mental disorder, but to what extent it should be considered the cause of such trouble is not, I feel, made clear.

Considering the amount of clinical material dealt with—2,056 cases examined and treated—it would have been helpful and more convincing to have been informed of the number of cases wholly or partially cured, first of their sepsis and secondly of their mental disease. Every rhinologist will have encountered cases of such sepsis, latent or overt, accompanied by symptoms of neurosis and psychosis in a varying degree, and witnessed the satisfactory results, both local and general, of treatment in such cases, but few if any will have had access to anything like the number of advanced cases of this type dealt with by Dr. Graves, and it is for this reason that all would, I feel sure, welcome the publication of the results of this type of treatment—I am, etc.,

Worcester, March 10. J. B. CAVENAGH.

Treatment of Allergic Conditions

SIR,—In the *Journal* of February 27 (p. 438), Dr. E. M. Fraenkel goes very fully into the question of the diagnosis and treatment of allergic conditions. As regards treatment, everyone admits that if a specific allergen can be detected in a particular case specific desensitization is the ideal method. It is unfortunately true that the ideal method is seldom applicable. Dr. Fraenkel himself says:

"As the complete range of allergens that are responsible can rarely be discovered in any one case, I make use of those specific allergens that have been detected mixed together with either peptone or small quantities of old tuberculin."

Scientific advance consists essentially in discovering relations between apparently isolated phenomena. Thus, for a long time it was known that rickets was benefited by cod-liver oil taken internally, and also by ultra-violet light applied to the skin. These facts remained unrelated until the discoveries: (1) that vitamin D was essential to skeletal development; (2) that cod-liver oil contained vitamin D; and (3) that by action on ergosterol in the skin ultra-violet light produced vitamin D. Now it is a clinical fact, which can be verified by anyone who cares to look into the matter, that a large proportion of all cases of allergic asthma can be relieved in varying degree by suitable *x*-ray treatment. In most cases the desired result can be obtained by exposing the trunk below the diaphragm, the chest being covered. This was first demonstrated by Scott at the London Hospital. Good results may also follow exposure of the chest itself, especially where there is a definite bronchitis as well as asthma. Many of the phenomena produced by *x* rays are akin to those seen in protein shock, and one wonders if *x*-ray effects in allergic conditions are obtained by any process analogous, at second hand, to that of Dr. Fraenkel's non-specific injections.

This is unlikely to be the whole explanation, because the good effects of a single course may sometimes last for years; on the other hand, it seems impossible to predict in any given case how long the "cure" will last. From a practical point of view many apparently hopeless invalids who have for years had to have adrenaline injections several times a day are restored to useful life.

Much research is needed to determine, for instance, how much of the effect is due to action analogous to protein shock, how much to possible action on ductless glands or to the effect on the sympathetic nervous system. So much attention has been concentrated on the local action of *x* rays that it seems to be forgotten that there are constitutional effects—in other words, that *x*-radiation is a powerful "drug" with an action worthy of study by pharmacologists. In the past it has scarcely been worth while to show "cured" asthma patients at clinical meetings as the invariable criticism is made that the effects, though genuine, are due to psychological causes. Recently modifications of the sedimentation test (differential sedimentation test using vanadic acid and an interferometer) have made it possible to show that the blood serum undergoes definite changes in allergic conditions, and that it may be brought back to normal by suitable *x*-ray treatment.

Asthma is such a chronic condition, and *x* rays when effective give relief so rapidly, that it seems a pity they are not used oftener as a routine before resort is had to more tedious methods.

The technique is simple and can be carried out, if necessary, with a small diagnostic set. Voltages of 80 to 100 kV are very suitable. The field should be wide—about 12 inches in diameter, and not more than 50 *r* on the skin given twice a week. A 3-mm. filter of aluminium is used. It is best to begin with a subdiaphragmatic field. Many of these cases are extremely sensitive to radiation, and it is the radiation absorbed per cubic centimetre of body tissue which seems to count. Hence the danger of high voltages, even though the skin dose may remain small. With treatment twice weekly relief should be experienced within three weeks. If such relief is not very evident after six sittings, those not experienced in the method would be wise not to persist.

A similar technique often gives relief in allied conditions, such as mucous colitis. In these days a diagnosis of malignancy immediately raises the question of radiation treatment; there is equally good reason for thinking of it where either allergy or chronic inflammation is concerned.—I am, etc.,

London, W.1, March 4. F. HERNAMAN-JOHNSON.

Ovarian Pregnancy

SIR,—The recent correspondence in the *Journal* on intraperitoneal haemorrhage from a Graafian follicle prompts me to report an authentic ovarian pregnancy.

On June 25, 1936, I was called at 11 a.m. to a patient aged 26 years, married, and with one child aged 5 years. The history was of a sudden severe abdominal pain, and collapse, at 8 a.m. the same day. At first sight the case suggested a ruptured ectopic pregnancy, but against this was a history of a normal period three weeks before, and external haemorrhage was completely absent. The patient was removed to the Crewe Memorial Hospital, where Dr. Howard English did a laparotomy under open ether.

The peritoneal cavity was full of recent blood clot; when this was sufficiently cleared its source was found to be the left ovary. The haemorrhage had stopped (from the severe loss and fall in blood pressure), and a clot half an inch in diameter was adherent to the ovary. The clots were swabbed out and the ovary was removed, the uterus, both tubes, and the right ovary being normal. The abdomen was closed; other organs were normal. Recovery was uneventful. Section of the specimen showed an ovarian pregnancy.

At first sight this was a ruptured ectopic pregnancy; the short time from the last period and the absence of external haemorrhage were confusing. At operation to have treated this case as a "lutein haemorrhage" and left the ovary *in situ* would have been a disaster. From the laboratory report prolonged research was necessary to confirm the fact of an ovarian pregnancy, which leaves the question open as to whether it is wiser to remove the ovary in all cases.

This report was typed before Mr. J. C. Leedham-Green's interesting letter appeared in the *Journal* (March 6, p. 527). But why must the tube be sacrificed? I thought one of the criteria of an ovarian pregnancy was the absence of trouble in the uterus, the tubes, and the other ovary.—I am, etc.,

Crewe, March 6. W. L. ENGLISH.

Prostatectomy by the Two-stage Method

SIR,—I have read with interest the letter from Sir William Wheeler (*Journal*, March 13, p. 581) on the present position with regard to the surgical treatment of prostatic obstruction. His statements will, I feel sure, prove acceptable to most reasonable surgeons. I regret that in my previous letter (*Journal*, February 27, p. 472) I seem to have created an impression of overwhelming bias in favour of the Harris technique; this was certainly not my intention. I did resent Mr. Irwin's obvious complacency in his championship of the older methods, and disliked his aspersions on the technique of my friend, the late Mr. S. Harry Harris. As the result of following in detail the technique taught to me by Harris I have

achieved results which I believe to be much superior to those achieved by other methods, and particularly that sponsored by Mr. Irwin. At the same time I fully realize that the Harris technique is not suited to every case or, for that matter, to every surgeon. Different patients call for different methods of treatment, and thus in some cases I would use the method of transurethral resection and in others the method advocated by Sir John Thomson-Walker, or even in an odd case that described by Mr. Irwin. In Mr. Irwin's letter of March 6 (p. 528) there are some statements not dealt with by Sir William Wheeler which call for comment.

1. The catheter in the urethra and bladder does not remain in for "twenty or more days in the majority of cases." Twenty days (ten before operation and ten after) should be regarded as a maximum. Preliminary bladder drainage for seven days ensured satisfactory renal function in 69 per cent. of Mr. Irwin's cases, and it thus follows that on Mr. Irwin's own figures catheter drainage would have been necessary for only seven days before operation in that percentage of cases. Many cases require no preliminary drainage, so that ten days of catheter drainage following the operation suffices.

2. Mr. Irwin states that he has visited "some of the patients operated on by one of the greatest exponents of the Harris technique . . . when I have watched the pus dripping from the urethral meatus of a swollen penis," etc. I have never seen such a sight myself. I consider it must be a rare occurrence, and probably the result of submitting patients to the Harris operation before "the greatest exponent" realized the immense importance of meticulous care in the preliminary treatment so stressed by the late Mr. Harris. The "greatest exponent" must have been a man (or woman) of the greatest honesty to exhibit such cases to Mr. Irwin. They were probably shown as a warning of what may occur should there be any deviation from or modification of the treatment laid down by Harris.

3. I admire the fortitude of Mr. Irwin's patients who suffer gauze packing to be removed from the prostatic cavity without anaesthetic and without complaint.

4. Mr. Irwin would like to know my grounds for thinking that the Harris technique is a tremendous advance on the Thomson-Walker operation. I should have thought that I made the advantages sufficiently clear in my letter (*Journal*, February 27, p. 472). In Mr. Irwin's opinion "the Thomson-Walker technique in which the patient is left with a large vesical outlet is infinitely superior to that of the Harris method in which the patient is left with a deformed vesical neck." Is Mr. Irwin quite sure that when complete healing takes place after the Thomson-Walker technique there is a large vesical outlet? Even if one admits such a statement, is a large vesical outlet a natural condition? What grounds has Mr. Irwin for stating that the Harris method results in a deformed vesical neck? It seems much more probable that after the Harris operation the condition of the vesical neck approaches more nearly to the normal than after any other prostatectomy operation.

5. Mr. Irwin's sophistry in endeavouring to make clear that when he writes "the mode in which the bladder neck is sutured round the indwelling catheter" really means that the bladder neck is *not* sutured round the catheter is too much for me.

6. Mr. Irwin criticizes the results of two operations performed by the late Mr. Harris during his visit to this country in 1935. The result of the Harris operation depends almost entirely on the preliminary treatment. I would need to be assured that in the cases mentioned Mr. Harris had complete control of the preliminary treatment before apportioning any blame for results which did not attain to the high standard he himself set. Moreover, it would be wrong to say that after every Harris operation the wound remains absolutely dry when the catheter is removed; in my previous letter I referred only to the average case. In many of my earlier cases leakage persisted from a pin-hole suprapubic sinus for any time up to ten days after removal of the catheter. I think the leakage was due to a flaw in my own technique, which I have now mastered, as recent cases have healed by first intention.

7. Mr. Irwin takes it upon himself to make the statement "that it is absolutely impossible to prevent puckering and pocket formation in a very large percentage if not all of the patients." I must regard this as mere vapouring in the absence of adduced evidence.

8. It is significant that Mr. Irwin makes no mention of residual bacilluria or the time required for healing of the suprapubic sinus in the method he advocates. Two of the most important points in favour of the Harris operation are the prompt healing of the abdominal wound and the rapid disappearance of bacilluria.

In conclusion there is one thing I should like to emphasize, and that is that any new method in this difficult branch of surgery demands practice and experience over a considerable period before its value can properly be assessed. Premature judgement, above all things, is to be deprecated.—I am, etc.,

Glasgow, March 8. WALTER W. GALBRAITH.

SIR,—I was very much interested in Sir William Wheeler's letter (*Journal*, March 13, p. 581), in which he diagnoses a rise of temperature in Mr. Galbraith and myself. I can assure him that in my own case there has been no rise of temperature, and I have only been concerned to state the results of my own experience.

Sir William says "the type of operation should vary in accordance with the surroundings." I cannot imagine any surgeon of experience undertaking a prostatectomy outside a hospital or nursing home, and it is a surgeon's duty to get the right surroundings before operating. Sir William accuses me of coming to conclusions with regard to the Harris operation as a result of observations made on "a case." I have certainly not done so, and I should never base my conclusions on observations made on one case alone.

Sir William states that he varies the operation of prostatectomy "to suit, to the best of my judgement, each individual case." Sir William in this way gives us to understand that he can evaluate the patient's power to withstand a certain operation. I am constantly coming across cases which were considered ideal for the Harris operation, but which in the event have proved unable to stand the extra strain imposed by the Harris technique. Consequently I feel it a much better policy to work on the argument that what is good for a "bad risk" is also good for a "good risk."

"When the gland is removed," writes Sir William, "and the cavity visualized it may be obvious that the wisest course is to leave well alone." We must therefore conclude that Sir William's technique often makes a long operation—which must severely tax the patient's strength and imperil the outlook—when as much could be accomplished in a quarter of the time or less and with proportionately less danger to the patient. Sir William thinks the Harris operation "ideal" in some cases. We must therefore conclude that he uses the Harris method of suture. Considering that the prostatic cavity often measures antero-posteriorly two to three or more inches, I should like to know how he contrives to pick up the whole prostatic bed with a needle the bite of which is very little more than one inch. Perhaps this is why the boomerang needle "does not appeal to him." Realizing how thin is the wall separating the prostatic cavity from the rectum, I have always felt suspicious of the elaborate diagrams which show the needle passing through this wall without entering the rectal cavity. I should like to know if Sir William claims to do this, and if so what needle he uses. If the whole prostatic bed is not taken up, then it must follow that there is left a large pocket in which urine will stagnate. I am inclined to think that none of the Harris technique enthusiasts have ever been clear on this point.

Sir William states that Harris was able to "eliminate haemorrhage and sepsis." The cases which Mr. Harris did at St. Paul's Hospital proved conclusively that he did not eliminate either haemorrhage or sepsis. And if Sir William feels he cannot eliminate haemorrhage and sepsis, what are the advantages he claims for the operation? Sir William says he has used open suction, and that he is convinced that

"suction has diminished the incidence of post-operative haemorrhage." Surely this is illogical, to say the least of it.

Sir William ends his letter by quoting a fellow practitioner as saying that the surgeon who is never in doubt is invariably wrong. It seems to me that the surgeon who is always in doubt and who cannot separate the good from the bad is rather a danger to the community than otherwise.—I am, etc.,

London, W.1, March 13. W. K. IRWIN.

Cancer of the Breast

SIR,—In his letter of February 27 (*Journal*, p. 471) Mr. Sampson Handley has failed to appreciate my expression of indebtedness to him for suggestions on the use of radium, which, if like many others they failed to fulfil expectations, were useful at the time. Not only does he regard my tribute to Mr. G. Keynes as hostile to himself but criticizes a letter in which I did not even refer to the theory of permeation and has taken me to task for differing from his views on that theory. A theory is not a proven fact; it is not even a truth, and presupposes that more than one hypothesis is possible.

The slides which he used to exhibit to emphasize his views in my opinion only showed where the cells were at the time the slides were cut. How the cells reach their position—whether, as he thinks, by continuous growth along the lymphatic in which ninety-nine out of a hundred cells disappear, or, as I suggest, by the ordinary process of embolism along the lymphatics—is a matter of opinion. My view on the subject was expressed in the *British Journal of Surgery* (April, 1925), and followed a similar criticism by a more distinguished man, Sir James Beatson, in the preceding number of the same journal. My view, therefore, is certainly not singular and can scarcely be regarded as unreasonable.

The possibility of dissemination of carcinoma by the blood stream has been so fully established by the efforts of innumerable pathologists that most textbooks include illustrations of veins being invaded by growth. The importance of this in explaining clinical problems has not yet been fully recognized and is to some extent new, and perhaps its teaching may not yet be considered orthodox by those brought up to think otherwise. Mr. Sampson Handley considers that blood dissemination "is late, and in a majority of cases there is no evidence that it occurs at all." He is fully entitled to this view; but what about rectal carcinoma? Would anyone nowadays attempt a wide operation for its removal without first examining the liver? Does Mr. Sampson Handley consider that the metastases so commonly met there are also due to permeation of the lymphatics and not accounted for by embolism along the portal blood stream? I need hardly remind him there is no direct lymphatic connexion while there is a direct circulatory one.

While naturally admitting the commonly recognized lymphatic spread, I believe that in every part of the body the dissemination of carcinoma is probably much the same, and I cite rectal carcinoma as an illustration of the undoubted circulatory spread which is not so widely recognized. I am credited with being the author of the saying "that the average life of 'a truth' is twenty years." I was unaware of it, but bow my acknowledgements. At the risk of being accused of bad taste I would suggest that this attitude of mind is at least as old as Pontius Pilate and is a commonplace of science to-day. From my experience the saying contains more truth and less nonsense than many other better-known medical aphorisms.

I hope that many of the views expressed in my book of 1924, quoted by Mr. Sampson Handley, are by now out of date, but would respectfully remind him that his own book is two years older. He also takes exception to my stating that we have at present no great hopes from the action of radium in inaccessible carcinoma. This statement is prompted by a considerable experience of such cases treated by radium, occasionally with unexpected good results, which, however, have ceased to make me optimistic. This statement, I believe, embodies the view reluctantly arrived at by most, if not all, of those engaged in this work. This of course does not turn the view into a truth. At one time we had other hopes. Our views may change again; let us hope they will. If Mr. Sampson Handley still holds other views on the subject I can assure him I am not, and I hope I never shall be, perturbed at differences of opinion, and I hope he will continue to reciprocate this feeling. We shall never all think alike.—I am, etc.,

London, W.1, March 8. DUNCAN C. L. FITZWILLIAMS.

Vegetable Diet for Children

SIR,—I was greatly interested in the annotation in the *Journal* for March 13 on the rearing of twins on a vegetable diet. I have long advocated that cow's milk is not only unnecessary for children but definitely harmful. Sensitivity to cow's milk occurs more frequently than to any other food and is a causative factor in the overgrowth of lymphoid tissue, as shown by enlarged tonsils and adenoids, catarrhal conditions, and asthmatic eczema. I have proved in many cases that children fed in the way described in the annotation are immune from the so-called childish ailments, and the matter was dealt with in medical literature some ten years ago. The asthmatic child does very badly on a milk diet, as would be expected from what I have already said, yet it frequently forms the chief item of food.

The annotation goes on to mention the "conventional mixed diet containing cow's milk," and the word "conventional" is well chosen, for it is not rational nor are the benefits of such a diet borne out by clinical evidence. True, some children put on weight on such a diet, but in my own practice I have repeatedly seen emaciated asthmatic children increase in body weight immediately milk was omitted from the diet and adjustments made as described in your annotation. Mention of "almond-lac" is interesting and important, and its high vitamin B content would be of the greatest value.—I am, etc.,

London, W.1, March 12. F. T. HARRINGTON.

Psychological Factors in Rheumatism

SIR,—I had hoped that Dr. J. L. Halliday's valuable and instructive articles (*Journal*, January 30, p. 213, and February 6, p. 264) would have evoked an interesting correspondence; but Dr. James Cook's letter (March 6, p. 529) was the sole response to Dr. Halliday's communications. Apparently Dr. James Cook has never heard of "the psychological approach" in the investigation of "physical" illness in any case. Many believe that it is by no means synonymous with psycho-analysis or with "the bedside manner." Referring to Dr. Halliday's most interesting articles I was surprised that he does not appear to have read any of the works of Dr. Alfred Adler, who first formulated the doctrine of "organ inferiority." I would suggest that Dr. Georg Groddeck has borrowed some of his ideas from Dr. Adler's works and has reclothed them in language of his own.

Considering Dr. James Cook's criticism of Dr. Halliday's articles one is tempted to inquire whether absence of

subsequent complaint is always to be regarded as evidence of "cure." In 1926 I had a profoundly depressed and very emaciated patient who had been for twelve days a "voluntary boarder" in a mental hospital. When convalescent the patient, against advice, went down to a remote country district in the depth of winter. Isolation induced a return of his symptoms: he called in the local doctor, who was displeased, apparently, at the prospect of having to listen to a long history of symptoms—most real to the patient, but infinitely boring to an uninterested and unsympathetic hearer. The doctor cut short the story by saying brusquely, "Oh, you must pull yourself together! We don't believe in *nerves* down here." The patient did not send for the doctor again, but the reason was not that he was "cured." One has heard of an eminent surgeon who, many years ago, introduced the procedure of "tunnelling" the hypertrophied prostate either with a Lister's sound or a metal catheter. The surgeon descanted upon the simplicity of the operation, which "completely cures the patient—at all events, I never see him again!" It was suggested by a colleague that the patient's failure to return might be due to other reasons than that of "complete cure."—I am, etc.,

London, W.1, March 15. C. W. J. BRASHER.

SIR,—To rid Dr. T. A. Ross of his "unpleasant thoughts" I would remind him that what he regards as "punishment" in a prison population are luxuries beyond the reach of thousands of his law-abiding fellow citizens. —I am, etc.,

Glasgow, March 13. JAMES COOK.

Death following Blood Transfusion

SIR,—Dr. F. Pygott, in the *Journal* of March 6 (p. 496) rightly stresses again the very real danger of death from pulmonary oedema following blood transfusion, but surely we have better methods of prevention than a rather paradoxical prophylactic venesection.

An injection of morphine and atropine—the recognized specific against pulmonary oedema—should be given as a routine measure fifteen minutes before the transfusion and repeated at the first sign of danger (cough, dyspnoea, etc.). This simple precaution will also keep the patient calm during the whole procedure, which must on no account be hurried. It is of the utmost importance to introduce the blood very slowly with occasional pauses, especially when there has been no acute haemorrhage and when the myocardium is likely to have suffered. The rate of transfusion should be recorded in every case.—I am, etc.,

London, W.1, March 6. F. E. LOEWY.

SIR,—In his interesting account of two fatal cases in the *Journal* of March 6 Dr. Pygott states that in the group to which those cases belonged there is "a cardiovascular system which has been injured to a greater or less degree . . . the amount of humoral fluid is at least normal. To this system we add a strain in the shape of an increase in blood volume, and thus place an extra load upon an organ which is relatively inefficient."

This explanation as to the cause of death in these cases appears to fit in with the observed facts, and may be correct. But Dr. Pygott suggests that there are only two alternatives which can be adopted to avoid this mechanical strain on the heart: (1) venesection before transfusion, and (2) frequent small transfusions "which are often a nuisance to both patient and doctor, and are naturally of very much less therapeutic value."

I venture to suggest that there is a third alternative, the drip transfusion method described by H. L. Marriott and A. Kekwick. By this method as much as eleven pints have been given to a patient, but the transfusion can be given as slowly as forty drops a minute, which raises the haemoglobin percentage by ten every four hours. At this rate of flow it is unlikely that the patient's "injured cardiovascular system" would be embarrassed, but Marriott and Kekwick state (*Proc. Roy. Soc. Med.*, 1936, **29,** 9) that "in patients in a weak condition or in the subjects of cardiovascular disease it is safer to raise the haemoglobin in stages by 30 per cent. at a time with an interval of three or four days between each stage." It is difficult to see why this procedure should be "naturally of very much less therapeutic value." Indeed, experience has proved it to be the opposite.—I am, etc.,

Shanklin, I.W., March 9. H. S. HOWIE WOOD.

A Clot in the Cannula

SIR,—In the *Journal* of February 20 (p. 417) Mr. W. E. Cooke raises the question of embolism as a possible danger in the use of the intravenous trocar and cannula described in an earlier issue (January 23, p. 173).

I would point out that any clot which obstructs this cannula is small, but manipulation of the trocar within a vein compresses the clot into the cannula fenestrations. The resultant gush of blood tends to wash out the cannula, removing this clot. Normally the flow from the cannula is rapid (I have often obtained 500 c.cm. of blood in three minutes) and clotting is rare. I think the danger of embolism from the use of this instrument is very remote.—I am, etc.,

London, W.2, March 6. REGINALD A. KING.

Radiograph or Skiagram

SIR,—If the *Oxford Dictionary* defines a radiograph as "an impression or image of an object produced on a sensitive plate by means of the Röntgen rays" (*Journal*, March 6, p. 530) I make bold to state that the definition is an imperfect one and that it should read: "an impression of the *shadow* of an object, etc.," because, of course, the Röntgen rays do not produce an image, but cast a shadow, the outlines of which are impressed on the sensitive plate or film.

This immediately suggests the word "skiagram" for what is popularly known as an "*x*-ray photograph," in preference to the word "radiograph," which as your correspondent Mr. Boulton Myles states "is by no means an ideal word. . . . A better word . . . would be very acceptable." The word "skiagram" is already in use in many parts of the world; it is etymologically correct (literally, "shadow-tracing"); and it could not in any circumstances be confused with a radio-telegram, a radiogramophone, or "an instrument for recording intensity or duration of sunshine." In any case I should be surprised if what is now generally called an "*x*-ray photograph" is not still generally called an "*x*-ray photograph" (or, more simply, an "*x*-ray") by the public and the majority of the medical profession in twenty years' time. However, if a crusade is to be undertaken for the use of a more elegant term, I suggest that "skiagram" is the word which should be adopted.—I am, etc.,

Stourbridge, Worcs., March 9. R. S. LAWSON, M.S.

Obituary

R. G. RIDDELL, M.D., F.R.C.S.ED.,
Consulting Surgeon, Torbay Hospital

The death of Dr. Robert George Riddell on March 6 has robbed Torquay of a senior practitioner esteemed and beloved alike by patients and colleagues. He was educated at Edinburgh, and took not only his M.D. degree but also the F.R.C.S.Ed. After Edinburgh he did hospital appointments in Birkenhead, and then moved to Rotherham, where he practised for over twenty years, and was first president of the Rotherham Rotary Club. It was in 1923 that Dr. Riddell first came to Torquay, and he later was elected surgeon to the Torbay Hospital, which appointment he resigned on account of the age limit two years ago. He had always a kindly, tolerant, and Christian outlook on life, and possessed high ideals as to the duties of medical men to colleagues and to the community. Dr. Riddell occupied an outstanding position in the Torquay Medical Society and the Torquay Division of the British Medical Association, of which he was chairman in 1928. He was universally popular, and everyone listened with respect and attention to his wise and common-sense advice. As a surgeon he achieved a high local reputation, and continued to do good and reliable work even after a serious illness a few years ago. He believed it to be the duty of a doctor to take part in all kinds of public activities that were for the good of the community, but could never bring himself under any circumstances to say an unkind word about anyone. The Torquay profession mourns a great loss, and extends heartfelt sympathy to the bereaved family.

The late Dr. ALBERT SOPHRON SIEGER, port medical officer and inspector of aliens at Glasgow, was born in 1875 at Greenock. He entered the University of Glasgow and took the triple qualification L.R.C.P., L.R.C.S.Ed., L.R.F.P.S.Glas. in 1899, and four years later obtained the Glasgow D.P.H. After a short time in general practice he was appointed civil surgeon to the military hospital at Devonport, and was then attached to the South African Field Force from 1899 to 1902, after which he returned to this country to take up public health work. In December, 1903, he joined the Glasgow Port Local Authority as assistant port medical officer, and was later promoted to the senior post. In 1914 he was attached at the outbreak of the war to the staff of Ruchill Fever Hospital, and was later superintendent of Shieldhall Fever Hospital. Towards the close of 1915 he obtained a commission in the R.A.M.C. and served in Malta and Alexandria. In 1919 he resumed his duties with the Port of Glasgow Authority, and in the following year became inspector of aliens. He was a Fellow of the Royal Institute of Public Health and an active member of the Association of Port Sanitary Officers, being much engaged at the time of his death with the coming annual meeting of the latter organization. Dr. Sieger joined the British Medical Association in 1921, and was very popular with all his colleagues, having many friends in shipping circles. He leaves a widow and three children.

Dr. JOHN LIDDELL, formerly of Harrogate, died at Mont 'Estoril, Portugal, on February 28, after being ill for less than two days from a failing heart. He obtained his M.B. and C.M. degrees at Edinburgh University in 1882, and proceeded M.D. with honours in 1890. As a young man he had a knowledge of pathological and bacteriological technique which was uncommon at that time, and his medical colleagues in Winchester, where he eventually settled in practice, sought his skill and aid in affairs which, novelties then, are routine nowadays. In 1891 he moved to the more bracing climate of Harrogate, where he was to spend nearly the next forty years of his life. He was appointed honorary physician to the Royal Bath Hospital and to the Sunderland Infirmary's convalescent home, and wrote on the spa waters of Harrogate and their effect in diseases of the skin, as well as in all that is comprised under the title of "rheumatism." He was a keen member of the Dermatological Society and studied dermatological conditions with the microtome and microscope in his own laboratory at home, there being then no other adequate accommodation. He was specially interested in and successful with cases of rheumatoid arthritis. Some years later he introduced to Harrogate the Plombières system of colon irrigation, and it is now well established there as a valuable resource in spa treatment. Dr. Liddell joined the British Medical Association in 1884. Always an ardent golfer, he was vice-president of the Harrogate Club the day of his death, and had been a foundation member in humble early days of the club. Retiring in 1929, and being fond of the sea, he travelled for some years, though returning to Harrogate at regular intervals for a course of the treatment of which his own person was so excellent a recommendation. Only last year he had settled down in Wiltshire, at Highworth. The burial was in the British cemetery at Lisbon.

We regret to record the untimely death of Dr. ISOBELLA MACINDOE MALCOLM AITKEN on January 29, only five weeks after she had taken up duty with the Livingstonia Mission at Bandawe on Lake Shore, Nyasaland. After receiving her medical education at Edinburgh, where she had graduated M.B., Ch.B. in 1920, she obtained the D.P.H.Ed. and Glasg. in the following year, and began to specialize in public health, maternity, and child welfare work shortly afterwards. She had held the appointments of obstetrical house-surgeon at the Elsie Inglis Memorial Maternity Hospital, Edinburgh; senior house-physician to the Royal Hospital for Sick Children, Edinburgh; and junior house-surgeon to the Roby Street branch of the Royal Infirmary, Manchester. Going out to West Africa she joined the staff of the health department of the Gold Coast Medical Service in 1928, and was seconded four years later from there to Nyasaland. With her previous experience of hospital work, first on the Gold Coast and latterly at Fort Johnston, she was a most welcome recruit to the medical staff of the Livingstonia Mission, where she had proposed to develop child welfare work in the Chinteche district, in addition to her duties in connexion with the lepers and the Mission Hospital at Bandawe. Her death after a short illness was indirectly due to cerebral malaria. Dr. Aitken was a Fellow of the Royal Society of Tropical Medicine and had taken great interest in tropical diseases; she published a note on infantile trypanosomiasis in 1931 in the *West African Medical Journal*. She joined the British Medical Association in 1921.

Dr. PETER LIN YANG, F.R.C.P.I., who has died in Hong Kong Government Hospital as the result of an accident, was well known in medical circles in Ireland, where he did post-graduate work for six years. He was house-surgeon for a year at Steevens's Hospital, Dublin, and also studied in Edinburgh and the United States. He went back to Hong Kong two years ago and took up the assistant professorship of obstetrics and gynaecology in the University. He joined the British Medical Association immediately after graduating M.B., B.S. in 1929.

The death is announced of Dr. LÉON GERNEZ, who was at the head of the anti-cancer centre of the Tenon Hospital in Paris. It was not till comparatively late in life that he passed from a varied field in operative surgery to specialization in cancer work.

Universities and Colleges

UNIVERSITY OF OXFORD

Diploma in Ophthalmology

The Board of the Faculty of Medicine has made the following changes in the regulations which will come into force on October 1:

Regulation 6 (ii) Examination Statutes, 1936, p. 316, will read: "A certificate showing that the candidate has satisfactorily attended in the University of Oxford a course of instruction in the anatomy of the eye and its appendages, including the development and minute structure of these parts."

Regulation 6 (iii) will read: "A certificate showing that the candidate has satisfactorily attended in the University of Oxford a course of instruction in physiological optics and in the physiology of vision."

Regulation 6 (iv): for "duly" substitute "satisfactorily."

The last sentence of the first note to the form of certificate 1 (p. 317) shall read: "Two months of the period may run concurrently with the necessary courses at Oxford, and the Registrar may provisionally accept, when a candidate enters his name, a certificate for such concurrent period of two months subject to confirmation at the end of the period."

Certificate 2, lines 3–5 (p. 317), will read: "satisfactorily attended in the University of Oxford a course of instruction in the anatomy of the eye and its appendages, including the development and minute structure of these parts."

Certificate 3, lines 3 and 4 (p. 317), will read: "satisfactorily attended in the University of Oxford a course of instruction in physiological optics and in the physiology of vision."

Certificate 4, lines 3 and 4 (p. 318), will read: "satisfactorily attended a course of ophthalmology in the University of Oxford for a period of at least two months."

And the following note will be added: "The Registrar may provisionally accept, when a candidate enters his name, a certificate for the whole two months subject to confirmation at the end of the course."

UNIVERSITY OF CAMBRIDGE

At a congregation held on March 12 the following medical degrees were conferred:

M.D.—D. W. Smithers.

M.CHIR.—W. H. G. Jessop.

M.B., B.CHIR.—*F. G. Hinks, *F. B. Thomas, *B. L. Williams, *A. Rothwell, *D. G. Freshwater, *W. J. Montague, C. S. Humphries, A. D. Ledward, N. D. Jekyll, V. C. Robinson, E. G. K. Williams, G. I. Watson, I. C. Fletcher, B. C. M. Palmer, E. O. Walker, G. L. Broderick, H. D. Johnson, G. S. W. Organe, A. M. McFarlan, R. G. M. Keeling, F. D. M. Livingstone.

M.B.—*S. J. R. Reynolds, *W. G. Brander, *L. T. Hilliard, *J. H. Stothert, *T. S. R. Fisher, *W. M. Beattie, J. C. Newbold, J. Diver, J. R. Chambers, H. S. Wigfield, C. G. Batty-Smith, C. McNeil, T. C. Larkworthy, C. J. Martin, F. G. A. Beckett.

* By proxy.

UNIVERSITY OF MANCHESTER

A special meeting of the University Court on March 10 gave authority to confer the honorary degree of D.Sc. on Sir Henry Hallett Dale, C.B.E., M.D., F.R.C.P., F.R.S., Nobel Laureate, Director of the National Institute for Medical Research, Hampstead. It is proposed to confer this and other honorary degrees on June 2, when Founder's Day will be celebrated and the new library formally opened.

Dr. Stanley Hodgson has been appointed lecturer in forensic medicine and Dr. E. N. Rowlands chief medical assistant in the Department of Clinical Investigations and Research.

UNIVERSITY OF EDINBURGH

The University of Edinburgh proposes to confer the honorary degree of LL.D. upon Dr. Edwin Bramwell, F.R.C.P., Emeritus Professor of Clinical Medicine in the University, and consulting physician to the Royal Infirmary, Edinburgh.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

A meeting of the Council of the College was held on March 11, with the President, Sir Cuthbert Wallace, in the chair.

Mr. R. B. Wade of Australia was admitted an Honorary Fellow of the College.

Diplomas

A Diploma of Membership was granted to Donald Vale Hague.

A Diploma of Fellowship was granted to Mervyn Henry Bowzer Robinson.

Diplomas in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Physicians of London, to the following candidates:

A. Ahmed, E. Bacon, A. K. Banerjee, F. P. C. Claffy, F. J. Darbyshire, B. K. Das Gupta, G. S. Dhillon, M. M. A. Dubash, M. A. K. Durrani, R. L. C. Fisher, S. A. Foad, V. V. Gupte, Helen M. Herbert, R. F. Jamieson, Eileen M. Kennedy, H. M. Kera, R. Labhaya, C. R. D. Leeds, B. N. Pershad, J. D. Maude, Kathleen A. Pih, S. M. Ruwala, B. Sheehan, E. C. Srinivasan, Jean W. Strang, K. J. Talbot, B. D. Telang.

The following hospitals were recognized for the six months' surgical practice required of candidates for the Fellowship:

Victoria Hospital, Burnley: House-surgeon to Unit I; house-surgeon to Unit II.

Withington Hospital, West Didsbury, Manchester: Resident surgical officer; senior and junior assistant medical officer.

Prince of Wales's Hospital, Plymouth: Resident surgical officer; house-surgeon (1), house-surgeon (2), and house-surgeon (3) at Greenbank Road; senior house-surgeon at Devonport until July 31, 1938.

King Edward VII Hospital, Windsor: First, second, and third house-surgeons.

INTER-COLLEGIATE SCHOLARSHIPS BOARD

The London Inter-Collegiate Scholarships Board announces that an examination for fourteen medical scholarships and exhibitions of an aggregate total value of £1,800, will commence on April 26 (altered date). They are tenable at University College and University College Hospital Medical School, King's College and King's College Hospital Medical School, the London (Royal Free Hospital) School of Medicine for Women, the London Hospital Medical College, and St. George's Hospital Medical School. Full particulars and entry form may be obtained from the secretary of the Board, Mr. S. C. Ranner, M.A., the Medical School, King's College Hospital, Denmark Hill, S.E.5.

The Services

DEATHS IN THE SERVICES

Major BENJAMIN ALLEN MATURIN, R.A.M.C. (ret.), died at Southampton on January 7, aged 76. He was born at Lymington on May 4, 1860, was educated at St. Thomas's and Bart's, and took the L.R.C.P. and S.Ed. in 1884. Entering the Army as surgeon on August 1, 1885, he became major after twelve years' service, and retired on August 1, 1905.

Colonel ARTHUR KENNEDY, late R.A.M.C. (ret.), died in Dublin on December 28, 1936, aged 73. He was born at Ballygibbon, County Tipperary, on July 13, 1863, was educated at the Carmichael School, Dublin, and took the L.R.C.S.I. in 1881 and the L.R.C.P.I. in 1882. Entering the Army as surgeon on January 30, 1886, he attained the rank of colonel on September 29, 1916, and retired on November 15, 1919.

Lieut.-Colonel JAMES ROCHEID FORREST, R.A.M.C. (ret.), died on January 22, aged 80. He was born at Brompton on September 2, 1856, was educated at Bart's, and took the L.S.A. in 1882 and the M.R.C.S. in 1883. At Bart's he obtained an exhibition in natural science, the Wix prize, and the Hichen prize, also a gold medal for botany from the Society of Apothecaries. After holding the post of demonstrator in zoology at Bart's, he entered the Army as surgeon on January 31, 1885, passing in first, was on half-pay from November 18, 1892, to February 17, 1895, became lieutenant-colonel after twenty years' service, and retired on June 2, 1911. He took the D.P.H. at Cambridge in 1907, and after retirement the M.B., B.S.Lond. in 1927, and the M.D. in 1931. He served in the Sudan campaign of 1885, at Suakin, receiving the Egyptian medal with a clasp and the Khedive's bronze star; and in the Tirah campaign, on the North-West Frontier of India, in 1897–8, gaining the Frontier medal with two clasps. In 1914 he rejoined for service in the war of 1914–18.

Honorary Brigade Surgeon DUKE PARKE, R.A.M.C. (ret.), died on January 17, aged 90. He was born on August 10, 1846, was educated at the Ledwich School, Dublin, and took the L.R.C.S.I. and the L.R.C.P.Ed. in 1866. Entering the Army as assistant surgeon on March 31, 1868, he became surgeon major after twelve years' service, and retired, with an honorary step of rank as brigade surgeon, on December 4, 1886. He served in the expedition to Sherboro, on the West Coast of Africa, in 1883, when he was mentioned in dispatches.

Medico-Legal

ALCOHOL OR INSULIN?

Mock Trial held by the Fellowship of Medicine

The Road Traffic Act, 1930, s. 15, makes it an offence for a person in charge of a motor vehicle to be under the influence of drink or drugs to such an extent as to be incapable of controlling it properly. One of the most difficult questions of fact which arises out of this provision is how far the unfitness is due to alcohol and how far to some innocent factor. The Fellowship of Medicine did a useful service to the profession when on March 11 it staged a mock trial at 1, Wimpole Street, in which a typical situation of this kind was clearly worked out.

The Case Opened

A motorist (Mr. W. W. Anderson) was undoubtedly unfit to have control of his car: he had stalled his engine at a crossing when the lights went green, driven across it when they turned red again, zigzagged up the hill, and come to rest on his wrong side of the road, being found by a policeman with his head resting on his arms across the steering-wheel. He was taken to the station and at once examined at 10.53 p.m. He had all the clinical signs of drunkenness: vagueness about the incident and about where he had been going and how he had got to the station; face flushed; skin slightly moist; sleepy appearance; furred tongue; slightly alcoholic breath; exaggerated knee-jerks until he controlled them consciously; unsteadiness on standing with the eyes shut and the feet in line; inaccuracy in trying to put a finger-tip on the end of the nose; pulse full and rather fast. The police surgeon, whose part was convincingly acted by Dr. P. B. Spurgin, laid particular stress on the sluggish reaction of the pupils to light: they were somewhat dilated and took an abnormally long time to contract to light and to dilate again when the stimulus was removed. The defendant sent for his own doctor, Dr. T. R. Snelling, who examined him at 11.15 p.m. and found his gait, mental processes, speech, and reflexes normal, his face flushed and his pupillary reaction still slow, and pronounced him fit to drive. The defendant himself said he was a diabetic under treatment, taking regular doses of insulin. He had drunk nothing that evening but three half-pints of beer, the last being at 7 o'clock. Not liking the food at the public house he had been content with a few sandwiches only. He had taken a dose of insulin about 7, and at 8 o'clock, suffering from a raging toothache, he had gone to the first dentist in sight and had a tooth out after the gum had been sprayed with ethyl chloride. He had felt "muzzy" at the time.

Expert Evidence

In addition to the clinical evidence the prosecution called Dr. H. K. V. Soltau, an expert in the Widmark test for blood alcohol. Two samples had been taken at about 11.30 p.m. by Dr. Snelling in the presence of Dr. Spurgin, and in one of these Dr. Soltau found a content of 150 mg. of alcohol per 100 grammes of blood. The relation of the Widmark reading to the clinical condition is not very controversial, and was not seriously contested between the expert witnesses called on the two sides, who, however, contradicted each other in many other material respects with praiseworthy faithfulness to custom. The figures Dr. Soltau gave were: practically no disturbance under 100 mg. except in fine psychological tests; clinical signs of intoxication in 65 per cent. of patients with over 100 mg.; unfitness to drive in most patients with over 120 mg. People with abnormally high tolerance for alcohol, he said, do not usually show a high reading. For the defence Sir James Purves-Stewart said that anyone with a reading over 200 mg. was hopelessly drunk; 80 per cent. of people with over 180 mg. were moderately drunk; 66 per cent. of persons with over 160 mg., and 33 per cent. of persons with over 100 mg. showed clinical intoxication.

Fallacies of the Widmark Test

The defendant's Widmark reading was 150 mg., but both experts agreed that the test was subject to certain fallacies. The most important is the presence of acetone, which gives the same reaction as alcohol and which may easily be present in the blood of a diabetic up to 25 or 30 mg.; and an anaesthetic may account for another 5 or 10 mg. It was therefore necessary to knock off 25 or 30 mg. from the defendant's 150 mg. as doubtful. Acetone is not eliminated from the blood in under about four hours, and if the defendant, as he might have done, was carrying 30 mg. at 7 o'clock—the maximum dose short of acute signs of acetonaemia—this would not be much diminished by 11.30 p.m. He could not therefore be fixed with a higher blood alcohol than about 125 mg., and the jury had still to reckon with the non-alcoholic factors—hypoglycaemia, hunger, fatigue, shock after the extraction, the effects of the ethyl chloride, and emotional disturbance at being charged with a serious offence. Dr. Spurgin maintained that the sluggish reaction of the pupils to light was pathognomonic of alcoholism, but Dr. Snelling said that insulin would be capable of causing this symptom. The result was that the judge summed up strongly in favour of the defendant, and the jury, after a short conference, found him not guilty.

Commentary

The Fellowship, therefore, had prepared its script most successfully to load the evidence against the defendant up to a point which very nearly counterbalanced the doubt. The case was indeed a borderline one, for the awkward fact remained that the Widmark test showed at least 120 mg. of alcohol which could not be accounted for by any fallacy. The defendant got off largely because of the characteristic distrust with which the judge and jury obviously viewed the scientific evidence, and because of the stress which the judge placed on an answer by Sir James Purves-Stewart which indicated that in his opinion the 34 per cent. of persons who did not show clinical signs of alcoholism with 160 mg. in their blood must be hardened topers—an incredible percentage, spread over the whole population. The trial was therefore highly successful, for the facts were by no means improbable. The judge was Mr. W. H. Cartright Sharp, K.C., and the jury was composed of twelve persons eminent in various walks of public life. Counsel for the prosecution and defendant were respectively Mr. W. A. L. Raeburn, with him Mr. H. W. Paton, and Mr. Laurence Vine, with him Mr. O. H. J. Bertram: the witnesses and officers of the court were played very creditably by members of the Fellowship.

A CASE OF IMPOSTURE

At Manchester Assizes, before Mr. Justice Porter, Patrick Ryan, aged 38, a native of Manister, Croom, Ireland, pleaded guilty on six counts to obtaining food and medicines from two hospitals on the pretence that he was a medical man. A list of previous convictions dating back ten years, including a conviction for fraudulent conversion, for which he was sentenced to three years' penal servitude at the Central Criminal Court in 1934, was given by the police, who described Ryan as an unscrupulous rogue and an impostor of the worst type. He was sentenced to four years' penal servitude.

It was stated for the prosecution that Ryan went to Warrington Infirmary and told the house-surgeon that he was a medical man (a stethoscope in his pocket lent colour to his story) and had been injured in a car accident. He was treated, and later transferred to Leigh Infirmary. He told the authorities that his brother would be responsible for a bill of three guineas for treatment, but it was never paid. At Liverpool Stanley Hospital he gave the name of Dr. Francis Ryan of County Clare, told the same story, and was supplied with morphia and food. In a statement Ryan admitted to similar impostures at hospitals and nursing homes in Dublin, where he represented himself as a doctor, and elsewhere in Ireland, obtaining money from various persons, and asked that these offences might be taken into account. It was stated, however, that offences in the Irish Free State could not be dealt with at the present assize.

Medical Notes in Parliament

In the House of Lords on March 15 the Local Government (Financial Provisions) Bill was read a second time. On the following day the Divorce (Scotland) Bill was read a third time.

The National Health Insurance Act Amendment Bill, which has passed the House of Lords, was read a first time in the House of Commons on March 10. Mr. Oliver Stanley introduced the Physical Training and Recreation Bill on March 16. The Bill, which is supported by Mr. Elliot, was read a first time. The House of Commons this week debated the Estimates for the Air Force and the Army. Mr. Chamberlain brought in a message from the King inviting consideration of the Civil List for the new reign. A Select Committee of the House of Commons heard witnesses and counsel on the proposal to transfer Wadsley Mental Hospital from the West Riding County Council to the Sheffield City Corporation under the Sheffield Corporation Bill.

Sir Kingsley Wood announced an agreement to submit to arbitration the whole scale of remuneration for medical men under the National Health Insurance Act. The form of the tribunal and procedure will follow the precedent when this scale was last examined.

Dr. Howitt will be added to the Standing Committee on Scottish Bills for the examination of the Methylated Spirits (Scotland) Bill.

Factories Bill in Committee

Clauses 6 and 7 of the Factories Bill were ordered to stand part of the Bill when a Standing Committee of the House of Commons resumed discussion of this measure on March 9. On Clause 8 (Enforcement by District Councils for certain provisions of Part I) Sir JOHN SIMON accepted amendments proposed by Colonel Sandeman Allen extending to inland navigations the saving provided for railways and docks. On the motion that Clause 8 stand part of the Bill Mr. GRAHAM WHITE said that divided control as between different types of factory was undesirable. District councils might not have sufficient staff for inspecting workshops and factories. Good and sound administration would be secured if the whole responsibility for inspection were undertaken by the inspectorate of the Home Office. Mr. RHYS DAVIES said Clause 8 referred to factories in which mechanical power was not used and in which the responsibility for ensuring that the places were clean, lighted, and ventilated would rest exclusively with the local authorities. Different standards as to what was decency in a factory were laid down by local authorities.

Sir JOHN SIMON said he hoped that when the Bill reached the Statute Book the Home Office would secure a substantial increase in the number of factory inspectors. He had arranged this with the Treasury, and in due course would move the necessary financial resolution. They wanted the additional inspectors for the most important factory services. Inspectors were particularly skilled to look after the fencing of machinery and to see that important clauses of the factory code were observed, but a great range of work might clearly be charged to responsible local authorities. If local authorities did not do their duty Clause 9 provided for taking the work out of their hands. The provision in Subsection 2 in Clause 8, which entrusted to the district council the supervision of a factory where mechanical power was not used, would apply only to premises which used to be called workshops. The existing law entrusted these workshops to the district council. Later in the Bill Clause 145 (3) would provide that premises were not to be taken out of this class by reason only that mechanical power was used for heating, ventilating, or lighting the workrooms or other parts of the factory.

The clause as amended was then added to the Bill.

LOCAL AUTHORITIES' POWERS

On Clause 9 (Powers of Inspector as to Sanitary Defects Remediable by District Council) Mr. ALFRED SHORT moved to substitute alternative words authorizing the inspector where he was satisfied that no proceedings had been taken by a district council for punishing or remedying an act or default, to take the action which the district council might have taken for punishing or remedying such act or default. Mr. Short said local authorities had not displayed a great deal of activity in enforcing public health provisions in regard to factories. Mr. R. S. HUDSON said that to justify this amendment it was not sufficient to assert that medical officers of health, factory inspectors, and local authorities generally were not carrying out their duties efficiently. Mr. Short had merely made a general accusation of inefficiency against medical officers of health and local authorities.

On a division Mr. Short's amendment was rejected by 28 to 16. An amendment, moved by Mr. BUCHANAN, to authorize an inspector to take proceedings if the district council had not done so within five days of the notice of default, instead of within one month as proposed by the Bill, was withdrawn. A further amendment by Mr. SILKIN was negatived and Clause 9 was added to the Bill.

MEDICAL SUPERVISION AND MEDICAL TREATMENT

Clause 10 was also ordered to stand part of the Bill. On Clause 11 (Power to Require Medical Supervision) Mr. ELLIS SMITH moved to leave out the provision that the arrangements to be made for medical supervision of persons employed in a factory where special reasons for such arrangements had been found by the Secretary of State to exist should not include medical treatment. Sir JOHN SIMON said he was prepared to alter this restriction so that it should run, "Not including medical treatment other than first-aid and medical treatment of a preventive character." Mr. Ellis Smith said that proposal hardly dealt with what he had in mind. The Bill did not conform to modern standards in regard to silicosis, lead poisoning, dermatitis, and several other industrial diseases. The chief inspector's report for 1935 said that cases of tuberculosis of the lung occurring in specific places of employment had been disclosed in increasing numbers. The same report stated that lead poisoning was having greater effect on the health of people employed in industry, and that there had been no reduction in the number of deaths from silicosis and asbestosis. In Sheffield and in parts of Manchester and North Staffordshire people pointed out the effect of these diseases on women's faces. The Bill would be lacking unless it procured that these people received medical attention. At present their treatment was their own individual responsibility, whereas it ought to be the responsibility of the Home Secretary and of the employers.

Sir JOHN SIMON said the clause did something entirely new and was a great advance. Nothing in the present factory code required special investigation or medical supervision where an inspector found in a class of factory that owing to the nature of the process, or for other reasons, disease or other unfitness was developing. The clause would put on the occupier the duty of procuring that a properly skilled man watched what was going on, examined people who seemed to be developing illness, and found out what was the matter. The employers were willing to accept that burden under special regulations. Mr. Ellis Smith wished to provide in addition that there should be medical treatment at the expense of the occupier, but the national health insurance scheme was already in existence, and in many cases trade unions had elaborate arrangements for providing medical treatment. Mr. Smith's desire to ensure treatment of a preventive character would be met if the committee kept in the words "Not including

medical treatment," but added "other than first-aid treatment and medical treatment of a preventive character."

Mr. Ellis Smith then withdrew his amendment and the words proposed by Sir John Simon were added to the clause.

On a subsequent amendment Mr. BURKE asked whether regulations under the clause could prohibit the employment of young persons on certain processes. He had in mind a factory in which a good deal of naphtha was used and the fumes constantly made boys unconscious for periods, although the effect on older persons was not the same. Sir JOHN SIMON said that restrictions and prohibitions would not be made under this clause but under Clause 58, where special regulations in respect of dangerous trades might be applied particularly to young persons. The amendment under discussion was withdrawn, and, in reply to Mr. Buchanan, Sir John Simon said that the power to require medical supervision under Clause 11 could be applied to a section only of a factory. Mr. Buchanan asserted that in his part of Scotland the men working in one part of a factory some years ago were affected for short periods by a form of lunacy, and had to be taken into mental homes for care. No further particulars were given in respect of this assertion, and Clause 11 was added to the Bill.

The committee then adjourned.

FENCING OF MACHINERY

When discussion was resumed on March 11 Clause 12 (Prime Movers) came under full consideration. The chairman suggested that there should be a general discussion on the fencing of all types of machinery, and this arose accordingly on a motion proposed by Mr. ELLIS SMITH. Sir JOHN SIMON said the term "prime mover" was not contained in the existing Factory Acts. Enormous developments in the use of electrical machinery had taken place since the statute of 1901. Belts and pulleys had been largely replaced by electrical machinery, and it was a great thing to get rid of the old-fashioned pulleys, which had been responsible for many bad accidents. The question to be asked was whether a particular apparatus was in such a position or of such construction as to be as safe to every person employed on the premises as if it were securely fenced. If the answer was "Yes" nothing would be gained by fencing it. His officials had assured him that they believed the form of the clause was practicable. The best modern practice was that the whole machinery should be shut off. Additional safety provisions were made in subsequent clauses. Clause 13 (3) provided that no driving belt when not in use should be allowed to rest or ride upon a revolving shaft which formed part of the transmission machinery. To make that provision mandatory was an important contribution to safety. Clause 15, dealing with the lubrication of things in motion, was also important from the Home Office point of view, and would show that although there were cases where moving parts had to be lubricated, such work was not regarded as safe. The Home Office would study carefully what was said by the committee, and the inspectors were not disposed to encourage laxity in the matter.

The amendment moved by Mr. Ellis Smith challenging the clause was defeated by 26 to 15 and the clause was ordered to stand part of the Bill.

On Clause 13 (Transmission Machinery) Sir WALTER SMILES moved to insert that "only male persons over 18 years of age should be allowed to put a belt upon a revolving shaft pulley which ran at a speed of more than fifty revolutions per minute. He said the greatest number of accidents resulted from these moving belts. Mr. GEOFFREY LLOYD said the Government sympathized with the amendment, but did not think it right to have one which was quite so sweeping. There was no danger in women and young persons mounting moving very light belts. He invited Sir Walter Smiles to consult with the Home Office advisers to see whether a new clause could be inserted restricting the mounting of belts by young persons.

Sir WALTER SMILES withdrew his amendment and the clause was added to the Bill.

On Clause 14 (Other Machinery) Mr. ELLIS SMITH moved to provide that no person under the age of 18 should be employed in operating a circular saw or overhand planer. He said it was still impossible to guard such machinery as other machines were guarded. In practice most men did not allow boys to go on the machines until they were 18 years of age. Mr. LLOYD said these were not the only machines which involved special risk. The question was whether it was wise to mention in the Bill particular machines and not to mention others, as, for example, vertical spindle-moulders, which were also dangerous. The better principle was to give general power to deal with these matters by regulation because new and dangerous machines often came into use. The Home Office would consider whether it could stiffen up the regulation which did deal partly with young persons and would also consider the question of all circular saws.

Mr. ELLIS SMITH withdrew his amendment.

Colonel SANDEMAN ALLEN moved to leave out Subsection 3 of Clause 14, which provided that: "Any part of any material or article which is dangerous while in motion in any machine shall be securely fenced unless it is in such a position as to be as safe to every person employed or working on the premises as it would be if securely fenced: provided that the requirements of this subsection shall not apply to a case where it is not practicable to comply therewith without serious interference with the work." Mr. LLOYD said this also was an important new power which had not existed before. It was brought forward because of cases of serious accident where workmen had been injured, not by a machine but by a moving piece of material in the machine, particularly in lathes. The Home Office was clear on what it wanted but would go into the matter before the report stage and see whether it could define its purpose more exactly.

Colonel ALLEN then withdrew his amendments. Two other amendments were withdrawn and the committee adjourned until March 16.

Disposal of Trade Effluent

Lord GAGE moved in the House of Lords on March 10 the second reading of the Public Health (Drainage of Trade Premises) Bill. He said it was similar to a Bill introduced last year by Lord Gainford, which passed all stages in that House but failed to be considered in the House of Commons. The main purpose of the present Bill was to render rivers and streams more free from pollution than at present by extending facilities to traders and owners of factories enabling them to discharge trade effluents into sewers rather than into rivers. Authorities possessed these powers but had been unwilling to exercise them because of the expense which by so doing they imposed on these traders. Moreover, it was uneconomic to expect each factory to put down separate works for purification of effluents. To solve that problem much investigation and consultation had been needed. The Government proposed to require the local authorities either to come to agreement with the traders in regard to particular applications or to make by-laws setting forth the terms on which the effluents might be discharged into sewers. These by-laws must be approved by the Ministry of Health, and a right of appeal from the traders to the Minister was provided. The Bill was drafted as an amendment and extension of last year's Public Health Act. The Bill only dealt with regulation of what might be passed through drains, leaving the drains to be regulated by the Public Health Act. The waiting period before acceptable trade effluents might be discharged after notice was two months. The local authority might consent to accept trade effluents unconditionally, or subject to conditions, with an appeal provided to the Minister against refusal of consent or against the conditions imposed. By-law-making powers had been extended to enable the local authority to determine the maximum quantity of trade effluent which might be discharged from any trade premises on any one day without its consent. It was proposed to leave London out of this Bill. Later the London County Council might see fit to introduce legislation on similar lines.

Lord GAINFORD thanked the Government for reintroducing the measure, and said it had the support of the Society of

Medical Officers of Health and of other bodies. Lord STRABOLGI said the Opposition would give the Bill every help.

The Bill was read a second time and sent to committee of the whole House.

Estimates for 1937: Medical Provisions

The Navy Estimates for 1937 include a gross estimate of £482,160 for medical establishments and services, reduced by appropriations-in-aid to a net vote of £411,400, compared with £467,330 gross and £397,300 net in 1936. Provision is made for the pay of 103 officers of the Royal Navy and for one of the Royal Marines on the medical establishments. Allusion is made to receipts for treatment of Army and Air Force patients in certain naval hospitals, and to payments for treatment of naval personnel at certain hospitals of the Army and Air Force in pursuance of a policy of co-ordination to promote the most economical use of the hospitals of the Services. Provision is made for the payment of the fees of medical and dental officers going through post-graduate courses at civil hospitals.

The estimated expenditure on medical services in the Army Estimates for 1937 is £1,055,000 against £1,071,000 for 1936. The establishment of the Royal Army Medical Corps is fixed at 474 officers in 1937 against 471 in 1936. An increase of £25,000 to £107,000 is proposed in the vote for the pay of civilian medical practitioners, and of £27,900 to £92,000 in the vote for medicines, instruments, and miscellaneous charges. Provision for the Royal Army Medical College is unchanged at £33,300. It is stated that owing to the shortage of officers holding regular commissions some officers holding temporary commissions are employed at contract rates of pay. Sixty re-employed retired officers and civilian medical practitioners are employed where the number of troops does not justify the employment of officers on the active list of the R.A.M.C. Two medical officers are carried on the Chemical Defence Research Department. The Estimates are accompanied by a memorandum from the Secretary of State for War, which reports that in 1936 the health of the Army at home and abroad continued very satisfactory, and no undue sickness was attributable to special service in the Eastern Mediterranean. Mr. Duff Cooper adds: "The increase in the number of candidates for commissions in the Royal Army Medical Corps continues to be well maintained, an excellent type of young officer is now coming forward, and it may be hoped that the establishment of regular officers will be filled at no distant date."

A Supplementary Estimate for the Army in the year ended March 31, 1937, issued on February 26, included an additional £22,000 for the Army Medical Services.

In the Air Estimates for 1937 the provision for medical services is £439,000, compared with £382,000 in 1936. An increase of £26,500 to £186,000 is proposed in the pay of personal allowances of officers. Fees to civilian practitioners remain unchanged at £21,000. Medical stores and supplies increase by £10,000 to £35,000, and payments to hospitals by £10,500 to £49,000. The establishment of officers in the medical and dental branches is fixed at 285, against 242 in 1936. A provisional estimate is made of £100,000 for a new Air Force hospital in East Anglia, of which sum £9,000 will be voted in 1937. At Halton additions to hospital are to cost £80,000, of which £15,000 will be voted in 1937.

The Civil Estimates, 1937, for the Home Department, Law, and Justice include £73,059 for Broadmoor Criminal Lunatic Asylum, against £71,161 in 1936.

The Civil Estimates, 1937, for Education and Broadcasting include £55,000 grant-in-aid to the British Post-Graduate Medical School, a decrease of £16,000 from the 1936 grant. For building extensions to the school and meeting such part of the cost of certain extensions to Hammersmith Hospital as is attributable to the presence of the school £10,000 is devoted, and for expenses of organization and maintenance of the school during the initial period £45,000, making £55,000 in all. Any balance of the sum issued to the governors of the school which may remain unexpended on March 31, 1938, will not be liable to surrender to the Exchequer, but will be considered in connexion with subsequent grants.

Road Accidents

In a debate on the Estimates for the Civil and Revenue Departments on March 10 Mr. D. N. PRITT opened a debate on traffic control and road accidents. Mr. HORE-BELISHA said that an examination of passenger and goods vehicles over twelve months disclosed that 18,000 of these classes of vehicles had such defects as to render them mechanically unsafe. Out of 560 specially observed brake tests in 240 cases braking efficiency was under 30 per cent., in 180 cases braking efficiency was under 25 per cent., and in 130 cases braking efficiency was under 20 per cent. What must be the condition of the brakes of the nearly 2,000,000 private vehicles not subject to such tests? The House could derive some encouragement from the reflection that whereas from 1931 to 1934 there was a continuous rise in accidents in relation to the number of vehicles that tendency had happily reversed. Figures of the total killed and injured per 1,000 vehicles licensed were: in 1931, 94 per 1,000; in 1932 the figure was 95; in 1933 it was 97; in 1934 it was 99; in 1935 the total killed and injured per 1,000 vehicles licensed had fallen to 88, and in 1936 to 85.

Commander FLETCHER said that in January, 1936, there was an accident every two minutes. One hundred children were killed every month and 4,464 people were killed or injured weekly. Mr. H. G. STRAUSS said nearly 70 per cent. of fatal accidents occurred on straight roads or open roads with a good sight line. More than 85 per cent. occurred in clear weather and two-thirds in daylight. One of the main factors was abuse of the motor horn. The Highway Code did not, from beginning to end, contain a single recommendation to sound the horn in any circumstances whatever. But the Minister might go further in two respects: in regulating the use of the horn; and in prescribing the nature of the instrument.

Replying to the debate Captain HUDSON said a committee which had been dealing particularly with the noise created by motor cars and motor cycles had now turned its attention among other things to the stridency of motor horns. The analysis of road accidents had shown that 90 per cent. were due to the human element. Some 50 per cent. happened on straight roads. Some 33 per cent. of accidents were caused by motorists; 28 per cent. by pedestrians; and 26 per cent. by cyclists. Last month 321 persons were killed on unrestricted and 140 on restricted roads. It would be unwise to rely on the speed limit alone for preventing road accidents. The death roll had fallen from a peak of 7,300 in 1930 to about 6,500 in 1936, in spite of an increase of some 480,000 motor vehicles.

A motion moved by Mr. PRITT to reduce the Estimates was defeated by 185 to 104.

Capitation Fee in Respect of Young Persons

Mr. RHYS DAVIES on March 15 asked the Minister of Health when he intended to introduce a Bill to bring into health insurance young persons on entry into employment; whether he had now come to an agreement with the medical profession as to the panel fees in respect of such persons, and, if so, what was the amount agreed. Mr. R. S. HUDSON replied that Sir Kingsley Wood could not say at present when this Bill would be introduced. The question of the doctors' fees for the young persons referred to had become bound up with the larger question whether the fees now paid for all insured persons called for revision by way of increase or decrease, and the Minister had agreed with the suggestion of the medical profession that the whole matter should be referred to an independent court of inquiry.

Health Insurance Practitioners

Sir KINGSLEY WOOD, replying to Mr. Lyons on March 15, said that the numbers of medical practitioners under agreement with Insurance Committees in England and Wales in 1935 and 1936 were 16,552 and 16,700 respectively, and the total amounts paid to them from national health insurance funds in respect of those years were £7,345,338 and £7,728,000. The last-named figure was approximate, as the returns of expenditure were not yet complete.

Mental Out-patient Clinics in Scotland.—On March 9 Mr. LEONARD asked the Secretary of State for Scotland the number of out-patient clinics functioning under the Board of Control for the use of persons conscious of incipient mental trouble. Mr. ELLIOT replied that there were nine mental out-patient clinics in Scotland—four in Glasgow, three in Edinburgh, one in Paisley, and one in Perth. Seven were attached to general hospitals, and all were under the direction of psychiatrists from mental hospitals.

Benefit Rates of Approved Societies.—Mr. JAMES GRIFFITHS asked on March 11 the average cash value of the additional benefits provided by approved societies under the National Health Insurance Acts. Sir KINGSLEY WOOD, in reply, assumed that Mr. Griffiths referred to increases in the statutory rates of sickness, disablement, and maternity benefits, and said the average increase, covering some 70 per cent. of the insured population, was about three units, which was 3s. a week in respect of sickness benefit, 1s. 6d. in respect of disablement benefit, and 6s. in respect of maternity benefit. Some approved societies had made no increase. Some of the most prosperous had made an increase of five units and also devoted funds to various treatment benefits.

Trend of Population.—Sir KINGSLEY WOOD told Mr. Cartland on March 11 that the Registrar-General was continuing and extending his investigations and researches into the trend of population. Consultation was also proceeding to secure the co-operation of the committee recently formed under the chairmanship of Professor Carr-Saunders. At the present stage this was the most useful course to adopt.

Medical Instruction in Air Raid Precautions.—Mr. GEOFFREY LLOYD told Mrs. Tate on March 11 that sixteen medical instructors had been appointed who gave instruction in anti-gas precautions to medical practitioners, nurses, and medical students. Up to the end of last month 3,059 doctors, 2,459 nurses, and 569 medical students had been trained. Arrangements were made through the British Medical Association, the College of Nursing, and the medical schools respectively. Mrs. TATE suggested that the Home Office should send instructors and apparatus to hospitals, in order that hospital staffs might become proficient in the use of gas masks and the necessary steps to take in the event of war. Mr. LLOYD said the instruction was often given at a hospital. If a doctor at a hospital had made himself proficient in the use of masks permission would in any event be given for him to instruct his staff. The doctors he had mentioned as medical instructors were stationed at key points throughout the country.

Milk for Infants and Expectant and Nursing Mothers.—On March 15 Mr. ADAMS asked the Minister of Health whether it was intended to make the scheme for the provision of cheap milk for expectant and nursing mothers and children under school age general throughout the country; and whether its application for the six summer months only would be extended to the whole year in future. Mr. HUDSON said that it was the intention of the Milk Marketing Board and the Commissioner for the Special Areas that the schemes which had been in operation in Rhondda since July 17, 1936, and in Jarrow since January 1, 1937, should run until September 30, 1937. Before that date the Board and the Commissioner would consider the results with a view to a decision on the future of the schemes.

Milk Adulteration.—On March 15 Mr. DAVID ADAMS asked the Minister of Health whether he was aware that cases in recent prosecutions by the Newcastle Corporation, under the Food and Drugs (Adulteration) Act, 1928, of vendors selling new milk deficient in non-fatty solids 17.2 per cent. and 15.4 per cent. respectively, were dismissed by the magistrates; and whether, as deficiencies on this scale indicated the presence of added water, he would consider legislation for the more adequate protection of the public in this matter. Mr. HUDSON replied that the Minister was not previously aware of these cases, but he had now received a communication from the town clerk of Newcastle with regard to them. The Minister was making further inquiries.

Deaths Following Vaccination.—Sir KINGSLEY WOOD informed Mr. Groves on March 15 that four death certificates were registered during 1936 on which the words vaccinia or vaccination appeared. The ages of the persons to whom the certificates applied were 4 weeks, 4 months, 10 years, and 26 years respectively.

On the same day Mr. GROVES asked the Minister of Health how many deaths following or caused by vaccination had been reported since January 1, 1937, and Sir KINGSLEY WOOD replied that he had information of three such deaths. Inquests were held in each case, and the verdicts were "broncho-pneumonia, post-vaccinial encephalitis," "generalized vaccinia," and "cerebral thrombosis following vaccination" respectively.

Free Meals to School Children in Scotland.—Mr. ELLIOT told Mr. Tom Johnson on March 16 that discretionary power to authorize the provision of school meals to necessitous children pending further investigation was allowed to head teachers of schools in Ayr, Dumfries, Fife, Wigtown, and Zetland. Provision of school meals pending investigation was authorized by the authority on the receipt of a report from the head teacher in Aberdeen, Edinburgh, Glasgow, East Lothian, and Sutherland. No instructions to insist upon production of a medical certificate proving under-nutrition before food was supplied had been issued by the Scottish Education Department.

Expenditure on Mental Deficiency.—Mr. CECIL WILSON asked on March 16 if the expenditure in respect of mental deficiency which had fallen upon the rates of county and county borough councils had risen from £694,390 in 1929–30 to £2,031,949 in 1932–3; and what caused such an increase. Mr. ROBERT HUDSON said the figures Mr. Wilson quoted did not represent the real position. The expenditure by local authorities amounted in 1929–30 to £1,500,244, and in 1932–3 to £2,191,847. An Exchequer contribution to the cost was paid in both years, in the former as a direct grant of 50 per cent. of expenditure, and in the latter as part of the block grant. The increase in total cost was due to the fact that this was a growing service, and more attention was now being paid by local authorities to the matter.

Immunization and Diphtheria Incidence in Huddersfield.—Mr. GROVES asked how many cases of diphtheria had been recorded in Huddersfield in children who had been immunized against that disease; and whether there had been any deaths in immunized children during the period in which immunization had been practised. Sir KINGSLEY WOOD said he had been in communication with the local authority, which had furnished the following information. Approximately 50 per cent. of the children of Huddersfield had been immunized to protect them against diphtheria. During the past four years, among the 50 per cent. not treated by immunization, there were 1,138 cases of diphtheria, resulting in 133 deaths. During the same period, among the 50 per cent. treated by immunization, there were forty cases of diphtheria resulting in one death. The one death was the only instance of fatal termination in a child who had been immunized.

Notes in Brief

Sir JOHN SIMON states that there has never been occasion to impose the maximum penalty under the statute regulating vivisection.

The average cost of living of working-class families was approximately 42 per cent. above the pre-war level at February 1, 1935, and 47 per cent. above the pre-war level at February 1, 1936.

Experience of the Factory Department of the Home Office has not proved that the effect of glass silk upon persons employed in handling it is so serious as was feared in 1931. Special inquiries are being made, however, to determine what further action is called for.

Medical News

The Ministry of Health states that a case of small-pox (variola minor) has occurred at Ripley, Derbyshire, and the diagnosis has been confirmed by a medical officer of the Ministry. The patient is an unvaccinated man of 23, who began to be ill on March 8. On March 10 the characteristic eruption of small-pox appeared, and he was seen by a doctor on the following day and forthwith removed to hospital. The source of the infection has not yet been determined, but the number of contacts is limited and these persons are being and will be kept under surveillance by the local authority until the expiration of the incubation period. The usual facilities for vaccination and revaccination are available. There are no other cases of small-pox in this country at the present time.

The annual meeting of the Society for the Study of Inebriety will be held at 11, Chandos Street, Cavendish Square, W., on Tuesday, April 13, at 4 p.m., and will be followed by a discussion on "The Environmental Factors in the Causation and Prevention of Alcoholism," to be opened by Dr. John Y. Dent.

The tenth annual exhibition of the New York Physicians' Art Club will be held from April 3 to 17 at the New York Academy of Medicine. Further information can be obtained from the secretary, Dr. Louis C. Schroeder, 50, East Seventy-second Street, New York.

The Anglo-Palestinian Club has arranged "an evening of medicine, magic, music, and murder" for members of the London Jewish Hospital Medical Society at the club premises, 43, Great Windmill Street, Piccadilly, W.1, on Sunday, March 21. Mr. Arnold Sorsby will take the chair at 8.30 p.m., and a charge of 4s. is payable at the door.

The sixth French Congress of Gynaecology will be held at Toulouse from May 15 to 18, with Professor Daniel of Bucarest as president of honour and Professor Meriel of Toulouse as president. The subject for discussion will be cancer of the cervix. Further information can be obtained from the general secretary, M. Maurice Fabre, 1, Rue Jules Lefebvre, Paris 9e.

A lecture on the theory and practice of contraception will be given on April 2, at 6 p.m., at the Walworth Women's Welfare Centre, 153A, East Street, S.E.17, followed by demonstrations on April 9, at 6 and 7 p.m. These are open to medical practitioners and to students who have completed their gynaecological course. A fee of 5s. is charged. Those attending a demonstration should bring rubber gloves.

The issue of the *Wiener klinische Wochenschrift* for March 5 is dedicated to Professor Julius von Wagner-Jauregg, on the occasion of his eightieth birthday on March 7; the *Wiener medizinische Wochenschrift* for March 6 contains a bibliography of his writings.

Dr. George R. Murray, Emeritus Professor of Medicine in the University of Manchester, is the medical member of a Departmental Committee appointed by the Home Secretary to consider the question of compensation for card-room and other workers in the cotton industry disabled by respiratory disease.

Dr. Axel Munthe, author of *The Story of San Michele*, who lives at Capri, has recently given 100,000 lire to the local hospital and other sums for the erection of an almshouse and for helping the poor inhabitants of the island.

Brevet Colonel Herbert John Shirley, C.M.G., T.D., has been appointed a Deputy Lieutenant for the County of London.

Professor Giuseppe Bastianelli, director of the Institute of Malariology at Rome, has been nominated president of a special committee for the study of malaria of the Health Section of the League of Nations.

Letters, Notes and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

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The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

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QUERIES AND ANSWERS

External Use of Iodine

Dr. JOHN KINNEAR (Dundee) writes: I agree with your correspondents that the *B.P.* liquor iodi mitis is irritating to many skins. In the skin department for several years now I have used 1 per cent. of iodine dissolved in carbon tetrachloride, and it is also used by several of the surgeons in Dundee Royal Infirmary. This preparation is entirely satisfactory and non-irritating. With regard to first-aid application to wounds I advise plain spirit, either methylated or surgical, and find that the percentage of cases showing signs of sepsis is much less than with "iodine."

Broken Sleep in Middle Age

"SUSSEX" asks for suggestions for treatment of early morning wakening in a busy professional man of about 50. The patient, otherwise well, can sleep from about 11 p.m. till 3 or 4 a.m., after which his rest is much broken, the result being that he is heavy and drowsy in the afternoon and evening following. The usual things have been tried—a hot drink on going to bed, a hot drink, biscuits, alkalis on waking. The blood pressure is low—systolic 108 mm. Would a prolonged course of sedatives be justifiable in a case like this? The man's efficiency is being impaired by his continued broken sleep. The condition has grown gradually over a period of years.

Infra-red Ray Apparatus

Dr. S. J. HIGGINS (Kinnerley, Oswestry) writes: Can any reader recommend from practical experience a small reliable apparatus for infra-red ray treatment which can be run off a private domestic electric-light circuit of 110 volts?

Income Tax

Liability of Retiring Partner

"X." explains that A., B., and C. have been in partnership, and as from January 1, 1937, A. has sold his share to D. following a three-months introduction period during which D. was paid as an assistant. As from January 1, 1937, all earnings will be for the credit of B., C., and D., but receipts from previous work will go to A., B., and C. What will be A.'s liability for 1936–7 and subsequent years?

*** A.'s income from the practice ceases as from January 1, 1937, and subsequent receipts represent capital in his hands—that is, the in-gathering of cash for earnings on which he has already paid tax. (The cash basis is merely a convenient way of measuring the gross income of any particular year.) His income tax liability for 1936–7 will therefore be in respect of three-fourths of the amount already agreed for that year, and D. will be liable to account for tax on the remaining quarter, in addition, of course, to his salary as an assistant for the three months.

A. will not be liable to tax in respect of any receipts from the practice for 1937-8. It may perhaps be advisable to add that A., B., C., and D. can, if all agree to do so, require the income tax liability to be calculated as if the practice had ceased on December 31, 1936, and a new one started on January 1, 1937; but it would involve a change to the "earnings" basis, cause a good deal of trouble, and probably lead to a very similar result.

Sale of Practice with Introduction

"TAX" writes: A. sold his practice to B. with effect on November 1, 1936, with a twenty-days introduction. B. paid A. for ten days, being half the total proceeds for twenty days. The income tax inspector wants to know how much A. received, and will presumably tax A. on that amount, but refuses to deduct the amount from B. and so will obtain tax twice over. Is this legal?

*** We do not see any grounds on which tax can be required from both B. and A. on the same sum. Up to November 1, 1936, A. was assessable for the profits of the practice, and anything he paid B. for services prior to that date would be an expense incurred by A. in carrying on the practice and therefore deductible in calculating his income tax liability; after the change in proprietorship on that date the position as regards A. and B. is precisely reversed, and B. is entitled to deduct as an expense sums payable by him for assistance rendered by A. It is just possible that the inspector may be intending to treat the period of introduction as one of partnership; in our view that is incorrect, but if consistently applied the difference in result would be immaterial.

Retirement from Partnership

"B." is a partner in general practice and intends to retire on September 30 and take a six-months post-graduate course. The firm's accounts are made up to March 31 each year. What will be his liability?

*** Assuming that "B." 's share of the profits for the year to March 31, 1937, as calculated for income tax purposes would be £*x*, he will be liable to account for tax for 1937-8 on half £*x* only. His liability for 1936-7 will not be affected unless all partners concerned join in requiring the liabilities of the old and new firms to be dealt with as if the change involved the setting up of a new practice, and such a requirement causes a good deal of trouble for problematical gain.

LETTERS, NOTES, ETC.

International Congress on Leprosy: Cairo, 1938

CORRECTION

A news paragraph in last week's *Journal* stated that the fourth International Congress on Leprosy will be held in Cairo on March 21. We are asked by Dr. E. Muir, general secretary-treasurer of the International Leprosy Association, who is also secretary of the Cairo Congress, to correct this announcement. The Congress will begin on March 21, *1938*, not 1937.

Wax Solvents

Mr. ST. GEORGE B. DELISLE GRAY writes: An ear full of wax can be cleared out without the slightest difficulty by means of the following technique. Instruct the patient to fill both "ear-holes" at night with warm sweet almond or olive oil. Heat a teaspoon and half fill with the oil; turn the head to one side and pour into the ear. When the ear-hole is full insert a small loose plug of cotton-wool so as to prevent the oil running out on to the pillow. Repeat the process in the morning before visiting the doctor. Both ears must be treated, as there is nearly always wax in both. Syringe the ears *hard* with a solution of bicarbonate of soda in water as warm as the patient can stand with comfort. The alkaline solution forms a soap with the oil and the softened plug of wax slips out usually in one piece. Always show it to the patient. He will not wait so long before having his ears syringed when he sees what a lot of wax he has in them. Always examine the ear with a speculum before beginning this treatment to make sure that there is wax and examine after syringing to make sure that all the wax has been removed. If the patient is suspected or known to have a perforation of the drum the wax should not be removed by syringing, but may be scooped away after softening with oil as above. This is done with a small blunt curette under direct vision through an aural speculum. With an electric auriscope this presents no difficulty.

Frauds on Doctors

Mr. HAMILTON BAILEY (London, W.) writes: It has been brought to my notice from several sources that a gentleman impersonating me is calling upon members of the medical profession and others requesting a loan of ten shillings for a taxi fare. It would save me much embarrassment if the next doctor to whom he makes this request would kindly communicate with the police.

Dr. ALEXANDER WILSON (Putney Hill, S.W.15) informs us that a man recently brought a parcel to his door bearing a Post Office C.O.D. label addressed to Dr. A. Wilson and marked "Urgent. For Special Delivery, Thursday 11/3/37. From —— Ltd., Wigmore Street, W.1, 7/6 to pay." The maid brought the parcel to Dr. Wilson's secretary; thinking that he must have ordered a book she gave the money to the maid to pay the messenger. No book had, however, been ordered, and the name of the firm does not appear in the Telephone Directory or in the Post Office London Directory. The parcel contained a non-medical book published in 1931, not apparently a new copy.

Dr. J. H. DOUGLAS WEBSTER writes: You very kindly put a warning note in your issue of January 23 (p. 202) about an impersonator of me who is still actively continuing his extortions. For example, owing to your notice having been seen, he was suspected on Thursday at Lewis's Library, but while they were telephoning to me he vanished; on Friday he attempted to cash a cheque (forging my name) at Burroughs Wellcome's; on Tuesday he borrowed 10s. from Mr. Stanley Cox (electrical apparatus manufacturers). Practically every day I am rung up by persons whom he has taken in or attempted to impose on in my name (druggists, tobacconists, etc.). Perhaps a brief further notice might help the police to catch this imposter through someone suspecting him in the act and detaining him.

A Warning

Mr. NORMAN HAIRE, Ch.M., writes: As I have just received through the post a circular from the London office of a German firm advertising a paste which they are introducing into this country, to be injected into the uterus to interrupt pregnancy, I feel that I should hasten to warn the medical profession of the dangers of the form in which it is presented. The firm in question puts the paste up in a tube, like a tooth-paste tube, to which is attached a nozzle with a cannula through which the paste is injected into the uterus. The tube is opaque, so that it is impossible to see what condition the contents of the tube are in. In the past in other countries deaths have occurred from the use of paste in such tubes. Some of the deaths have been attributed to changes in the paste brought about by chemical action between the constituents of the paste and the material of which the tube itself is composed. Others have been attributed to air embolism arising from bubbles of air ejected from the tube into the uterus. As the tube is opaque such air bubbles cannot be detected. The particulars given in the circular are misleading and likely to lead to disaster. Contrary to what is claimed, the method *is* a surgical operation, there *is* reason to fear infection unless it is carried out as a surgical operation, and the need for narcosis is *not* eliminated. In cases where interruption of pregnancy is medically indicated it may very well be carried out by the use of such a paste, but this should be put up in glass containers, to one end of which a plunger and to the other end a nozzle and cannula are attachable. Thus the surgeon can see the condition of the paste and eliminate the possibility of injecting air bubbles. The method should only be used by a skilled gynaecologist, and only in a hospital or nursing home—*never* in an ambulant patient or without an anaesthetic.

"Patient, Nurse, and Hospital"

The review under this heading of Miss Florence Fidler's book, *The Patient Looks at the Hospital* (February 27, p. 447), included two passages within quotation marks. In the first of these the words "mean, petty" should have been "petty, mean." The second passage was a paraphrase, and should not have appeared within quotation marks. The author's words with reference to ex-patients among working-class women are:

> "Though resentful, their principal thought is always that they must not 'upset' the hospital, because as panel patients they may have to go there again; and they know by their own, and by their friends' experience that unless they at all times express the correct amount of gratitude demanded, it may be held up against them in the future."